VOLUME XVIII NUMBER 7

THE ELEMENTARY SCHOOL JOURNAL

CONTINUING "THE ELEMENTARY SCHOOL TEACHER"

MARCH 1918

EDUCATIONAL NEWS AND EDITORIAL COMMENT

Department of Superintendence

The annual meeting of the Department of Superintendence of the National Education Association was characterized by constant references to the necessity of teaching nationalism in the schools and to the importance of bending every energy to the support of the government in the war. When speakers began to discuss problems of the course of study or problems of school organization they were invariably drawn in the direction of the ever central themes, nationalism and the war.

There was much discussion of the necessity of organizing a federal department of education. Various committees and conferences were engaged throughout the meeting in taking up the pros and cons of this proposal. There seemed to be very general agreement that a federal system of education ought to be evolved—and that immediately. The objection which was raised to immediate action was that Congress is too much engaged in other matters and ought not to be asked to take up at this time so serious a general problem. Some slight doubt was expressed as arising out of the danger that a change in the federal administration might bring over-radical changes in the educational policy of the country. In answer to these objections was presented the overwhelming

need of a centralizing and nationalizing agency to promote and guide education throughout the United States.

One of the most diverting papers was presented by an editor who thought that elementary-school subjects ought to be taken up seriatim. The child should be taught to read. While this is going on all other subjects should wait. Next he should learn to write. Next he should take number and only number; then, in order, geography, and so on. Why doesn't this editor get out all his advertisements one day, all his editorials another, and the news the next? He would then have time to think over educational matters.

It was voted to bring the next meeting to Chicago. This move will be welcomed by everybody who at the meeting just past had to hunt for meeting-places for miles up and down the board walk.

National Society for Vocational Education

The National Society for the Promotion of Industrial Education is no more. At its eleventh annual convention, held in Philadelphia February 21 to 23, it passed by the adoption of a new constitution into the National Society for Vocational Education.

The change in name is significant for two reasons. First, the period of "promoting" industrial education is believed by the members of the Society to be over. With the organization of a Federal Board for Industrial Education the first aim and purpose of the Society has been achieved. Secondly, the term "industrial education" is too narrow to describe the interests which now ask for recognition. There are commercial interests, agricultural interests, home economic interests, as well as the narrow interests of the industrial schools and of trade schools. So the name is to be changed and the scope of the Society is to be much enlarged.

There was one significant happening during the adoption of the constitution which will be of interest to school people. The paragraph proposed by the Committee on Constitution defining the objects of the Society is as follows: "The objects of the Society shall be (1) to afford, for all those who are interested, opportunity for the presentation and discussion of the various problems of

vocational education; (2) to make available the results of the experience of those working in the various fields of vocational education, both in this country and abroad."

It was voted without objection to amend this paragraph by adding the clause, "(3) to cultivate the closest possible relations between vocational education and general education."

After the constitution had been acted on paragraph by paragraph and was ready for final adoption, Mr. Pratt, who has long been the leading member of the Society and its responsible financial backer, moved a reconsideration on the ground that to specify the Society's relations to general education was to limit its action, in view of the fact that the Society must cultivate relations with labor and labor organizations and with employers. Mr. Snedden spoke in like vein and the adopted amendment was stricken out.

The present writer has repeatedly stated in the pages of this *Journal* that in his judgment any move which tends to set up in America a group of people or a group of schools which are intent on industrial education to the exclusion of general education is dangerous to democracy. No such scheme is possible in this country as exists in Prussia, of a dual school system.

The Society for the Promotion of Industrial Education was thoroughly undemocratic in its organization and purposes. Even at this meeting where the Society was going through its reorganization, the treasurer, Mr. Pratt, made a vigorous appeal for a membership adequate to support the organization. He pointed out that more than half of the funds of the old Society came from a few men who could probably be persuaded to go on contributing, but he said very truly that such an arrangement is bad and wrong in principle. The old Society has again and again been the center for discussions of a separatist type, aiming to keep vocational education and the common schools apart.

The new Society ought, in the opinion of the present writer, to put away the fundamentally wrong attitude of the old Society. Vocational education is not a thing apart. It can flourish only when it becomes a part of our national system. There is something larger than vocational education; it is American education. The new Society was perhaps wise in reconsidering its action; perhaps

not. One thing is certain—it will make the mistake of its young life if it attempts a policy of separatism in education. With best wishes for wisdom to the leaders of the new organization and for the carrying forward in a more democratic way of a work which up to this time has been relatively narrow in purpose and highly restricted in its control, this *Journal* pledges its support to the new venture just in so far as the Society cultivates the most intimate relations possible between vocational education and general education.

C. H. J.

Enlargement of School Opportunities

The following statement clipped from the *Boston Globe* is so wholesome as doctrine and so ably supported by strong school men that it deserves wide publicity:

The New England State Officers of Education, who have been in conference in this city discussing problems created by the war, yesterday made public the following statement of their views:

"The great war has deprived the nations of Europe of millions of their youth. The responsibility for the saving and the serving of the democracy of the future must rest upon those now at school.

"This situation requires that the work in our public schools be so related to our country's needs as to make the boys and girls capable in the work of reorganization that awaits them. The schools must secure and retain teachers who will be able to lead, and pupils must be kept in school for a longer period.

"It is important that we increase the emphasis that has been given to the subjects that deal with ideals of community and national welfare, and international relationships. To this end the schools should utilize such existing motives as will assist in developing these ideals.

"Teachers and public must be made aware of the patriotic importance and dignity of the school. This involves on the part of the public an increased financial support commensurate with the increased demands.

"We must resist every temptation to shorten the school year, and to release children before these ideals have become firmly established.

"It is no time for retrenchment in education, nor for a lowering of educational standards. Child-labor restrictions and school-attendance regulations, secured after years of struggle, must be safeguarded and protected. Any opportunity for the proper training of children lost now to children involves risk to the success of the democracy that is to be."

At the conference were State Superintendent of Public Schools Augustus O. Thomas, of Maine; State Superintendent of Public Instruction E. W. Butterfield, of New Hampshire; State Commissioner of Education Milo B.

Hillegas, of Vermont; State Commissioner of Education Walter E. Ranger, of Rhode Island; Assistant Secretary H. C. Morrison, of Connecticut; and State Commissioner of Education Payson Smith, of Massachusetts.

An Industrial Normal School

At Newport News there is a unique normal school. It was instituted to meet a specific need on the part of the United States government—the need for more shipbuilders. It is not unlikely that we shall hear a good deal about new types of vocational education in the near future. The demand for skilled workers is going to be large, and the supply is so short that devices will have to be developed—and that quickly—to meet the new demands.

The following description of the school at Newport News is supplied by its directors:

This school is known as the "Shipbuilders' Plattsburg." It is operated by Uncle Sam in a big shipyard where the din of chipping and riveting is heard twenty-four hours a day. It undertakes to teach only one thing—teaching. Most industrial training schools teach trades, and many persons still think that this school teaches shipbuilding. But if you were to apply for its course of instruction you must be a competent shipyard worker to be admitted, and the more you already know about shipbuilding the better. Its students range all the way from riveting foremen to shipyard superintendents, and from the practical man who cannot read to the vice-president and stockholder in a shipbuilding corporation.

This school is part of the vast detail organization which we have found necessary to build up before we can build ships to win the war. Before we were able to begin building ships we had to build shipyards and man them. It was discovered that shipbuilding had become almost a disappearing industry compared with other American industries, and that the number of men capable of teaching shipbuilding trades to other men, for the purpose of multiplying our ship workers by many thousands, was limited. How were we to tackle this job under the pressure of war, the destruction of German submarines, and the urging of speed, speed, and still more speed by Congress and the American people? That question arose soon after war was declared, and was quietly answered by the Emergency Fleet Corporation experts.

Up in New England there was a vocational instructor who had never stepped into a shipyard in his life. But he was a teacher, trained in the arrangement of technical knowledge so it could be most clearly and quickly laid before others. Summoned to Washington, he drew up a plan demonstrating that our new shipbuilding industry needed the teacher even more urgently than the workman just now. So he was promptly put to work in the industrial-training

section, and within a few weeks assembled at Newport News his first class, made up of fifty pupils sent from shipyards up and down the Atlantic coast.

Few of them came willingly—grown men do not like to go to school any more than boys. All came with a certain skepticism, saying, in effect, "Well, here I am, but you have certainly got to show me!"

The last pupil in the original class arrived several days late, from a shipyard far down on the Gulf of Mexico, and after a casual survey of the surroundings announced that he believed he would go back home.

"All right," was the answer. "If you don't feel that you can get anything out of this game, it would not be right to stay and waste your time and your employer's."

There being no train back home for some hours, the newcomer sat down and watched a class while he waited. This class was made up of practical shipyard workers like himself, and they were discussing the best way of teaching green helpers how to pass hot rivets and detect burnt ones. The visitor grew so interested that he missed his train—and changed his mind.

"I guess I better stay on here anyhow," he said, "if it is just the same to you."

The first lesson in this school is one of analysis. The instructors are extremely careful not to tell any of their pupils anything about shipbuilding, for what the practical shipyard man himself knows is to be made the basis of instruction. Some of them are experts in cutting, fitting, and riveting plates onto steel ships, others in drilling and reaming, others in chipping and calking, and still others in carpenter work on both steel and wooden ships. Most of them are steel-ship men, and as something like two hundred different trades and crafts must be enlisted to build a modern steel ship the instruction is as diversified as it is interesting and practical.

The pupil is a riveting foreman, perhaps, and has been sent down here because he is a good one—a man who has demonstrated a capacity to teach green helpers that job. All the operations connected with riveting work on ships have been analyzed by the instructors in this school and carefully diagrammed—the number of men required in each gang for pneumatic-hammer riveting, bull riveting, and hand riveting, with the specific places and tasks of heater, passer, holder-on, helper, and hammerman. But they tell the pupil nothing about this, because they want him to tell what he knows about riveting, and analyze his own methods from a new standpoint—that of arranging his information for the purpose of imparting it to others. Back home he has considered it good work to make a gang of riveters out of green recruits in three months. Here at the school they know he can rearrange his own knowledge in terms of teaching to such good purpose that he will probably be able to break in a first-rate riveting gang in four or five weeks.

"What do you do when you organize a riveting job?" they ask him. "And why and how do you teach others these things?"

Probably he has never thought of his job in terms of systematic teaching before. Supervised by instructors who have specialized in teaching all their lives, it is an interesting, new viewpoint. There is a job as an instructor waiting for him back home at the end of this six weeks' course under Uncle Sam if he makes good. He gets busy laying out his knowledge in terms of teaching, and presently has his trade sketched out on paper.

"All right," says the instructor, "that is what you want to teach. Now, how are you going to put it over so the other fellow will get it? He can only learn one thing at a time. What do you propose to show him first, and what will you show him after that?"

Once more the pupil goes to work on his papers, helped by suggestions from the instructor, and also by talks with fellow-pupils.

This preliminary work of analyzing his own trade and putting it into shape for teaching is done in a classroom at a shipyard. Presently the paper work is over, and they take him outdoors, amid familiar surroundings, putting him in charge of a gang working on a ship, to try out his methods by actual teaching. Here he finds himself thoroughly at home—on the old job, but with a new way of looking at work and at men. For lack of clear technical arrangement his method of breaking in new hands at home was probably slow and haphazard. He went from one man to another, correcting mistakes, showing how to hold a tool or perform a task. His teaching lacked consecutiveness and interest, because he had never thought it out logically. Some of the things he should have told men at the start occurred to him only after they had spoiled work because they did not know them. Some of the things that were most vital, perhaps, he never told them at all, because he had forgotten them himself, or assumed that anybody ought to know that much. Now he is not only led to analyze every step, leaving nothing out and putting everything in, in an orderly way for teaching, but, under the supervision of men who have taught teaching all their lives, learns to instruct others, giving them clear conceptions of the "Why" while he shows them the practical "How." Six weeks later he goes back home and becomes an instructor himself, and when his employer and fellow-workers catch the drift of this new viewpoint on shipbuilding, they usually want to go to school too.

One shipyard sent three men to the first six weeks' course at Newport News and twenty-two men to the second. And while there was some skepticism about the school at the start, that exists no longer. The teacher has quickly made his place in shipbuilding.

This is the first time in the history of American industry, it is said, that skilled mechanical workers have been sent to school to be instructed as teachers in their own trades. It is also the first time in the history of industrial education that a number of concerns, really competitors, have combined in a single industrial training institution. To be accepted as a pupil, a man must not only know his trade as a practical workman, but show some qualifications that promise to make him a good instructor. He must have had experience in

handling men, be a natural leader, and hold the respect of fellow-workers through his patience, dependability, steadiness, and knack of expressing himself. Preference is given men between the ages of twenty-five and forty years, with at least five years' experience in their trades, and experience in managing others. Given well-chosen men, willing to learn, the Emergency Fleet Corporation contributes part of the expense of instruction and board, provided the six weeks' course is finished, laying down the condition that the shipyard employing the pupil will keep him in its organization at least six months afterward. The pupil also agrees to remain with the shipyard for at least six months, and what he has learned is applied to the training of new shipyard workers, and in some cases other shipyard instructors.

This school, moreover, takes a keen interest in its graduates. For when they get back on the job their enlarged ability brings a certain danger. Having learned how to teach workers more quickly and speed up production, either they or their employers are apt to lose sight of the necessity for patient instruction in increasing shipyard output under war pressure, and instruction is lost sight of. The teacher turns workman again, and goes after production records. But because Uncle Sam depends upon a few hundred men, trained in this school during the next few months, to initiate perhaps one hundred thousand new workers in the shipbuilding crafts, he means to keep an eye upon that detail, and see that systematic training is not lost sight of in the excitement of playing the game.

With good industrial teachers in all our shipyards, and intelligent mobilization of workers from other trades, we are rapidly organizing a shipbuilding industry which should soon compare with the oldest and best in other nations so far as actual manual skill is concerned.

Shipbuilding is a highly specialized industry in itself, and through years of neglect the number of men familiar with its exacting crafts had dwindled to a pitifully small number for so great an industrial country as the United States. But even this remnant of skilled craftsmen and supervisors furnishes a good basis for rapid war-time expansion. Two things are needed: first, the teacher in shipbuilding, showing how to impart knowledge on efficient lines; and second, care to draw into shipyards workers of kindred trades. We have in this country hundreds of thousands of men familiar with auto repairing, sheet-metal work, structural steel construction, and like crafts. Carefully selected and skillfully taught, they can be made first-rate shipwrights in a short period if each is set to work at a shipbuilding task that dovetails into his old trade. The quarryman and foundryman, familiar with pneumatic tools, are easily transformed into shipyard chippers and calkers. The blacksmith can be made a good shipyard angle-smith if he will learn to handle thinner, lighter pieces of metal than he has been accustomed to working, and a structural-steel man from a skyscraper or bridge makes a good angle-smith too, when he learns how to handle heated iron instead of cold shapes. The house carpenter will find

himself at home in a dozen departments of the shipyard if he is adaptable and teachable, and thousands of shop-workers with special skill in machinery and metal easily graduate into the shop work necessary in shipbuilding.

Rochester's Junior High Schools

For several years the city of Rochester, New York, has been experimenting with the junior high school. The success of the school has been such that the system in that city is now moving rapidly in the direction of a general reorganization of all the schools so that the system will all be on the six-three-three plan.

In Rochester, as elsewhere, the building problem has been one of the leading reasons for bringing together in one building the upper grades, which formerly were scattered through several schools. The details of the various plans for the new buildings and their arrangement are given in the following clipping from that city:

Plans to relieve the congestion in the public schools and to eliminate the portable school buildings which have been in use in several sections of the city have been worked out by Mayor Hiram H. Edgerton and the Board of Education. Work on three new junior high schools for the northwest, southeast, and southwest sections is in the hands of the builders and architects.

The Jefferson Junior High School, which is under construction at the southwest corner of Exposition Park, on the site of the Vocation School building, is to cost approximately $560,000, and is to be one of the finest buildings of its kind in the country. This new school will relieve the congestion in the northwest section of the city and is expected to eliminate all the portables in that community. The Jefferson Junior High School will draw from Public Schools 5, 6, 7, 17, 21, and 34.

Architects are completing the plans for Monroe Junior High School, which is to be located on Monroe Avenue, on the site of the present School 15. This building will cost approximately the same as the Jefferson Junior High School and will be just as elaborate and complete in its details.

The completion of the Monroe Junior High School will mark the end of the portables which the heavy congestion in the southeast section made necessary. Those to be relieved are Schools 12, 13, 15, 23, 24, 31, and 35.

The plans for Madison Junior High School, which is to be built in Wilson Park in the nineteenth ward, are nearly completed, which will relieve congestion and do away with all the portables in the southwest section. Madison Junior High School will draw its pupils from Public Schools 3, 4, 16, 19, 29, and 37.

Jefferson and Madison Junior high schools are to be built on park land already owned by the city. This land has been placed at the disposal of the school board by Mayor Edgerton. The city also saves on the site for Monroe

Junior High School, which will displace School 15, which has been municipal property for a great many years.

The junior high schools will take the pupils of the seventh and eighth grades from the schools in their respective districts, as well as the first-year students from the East and West high schools. There will be accommodations for 1,200 pupils in each of the new junior high schools.

A great deal of the school congestion in the thickly populated northeast section was relieved when School 26, on Clifford Avenue, was transformed into the Washington Junior High School, the first junior high school in Rochester. This change was made two years ago and the good results obtained indicate the foresight and wisdom of the school authorities. The public schools relieved by the Washington Junior High School are Schools 9, 18, 20, 22, 25, 26, 27, and 36.

The junior high school is the solution of, not only the problem of congestion, but the problem of curriculum. Heretofore the curriculum, or course of study, has not considered capabilities and needs, but rather assumed that all pupils were of equal mental capacity. That all pupils are not of equal mental capacity is evident to all.

The junior high school provides differentiated courses along four lines—the academic for those who are going on to the upper high school; the commercial for those who are going into business; the industrial arts for boys who are going into the trades and to work, and the household arts for girls who need and want instruction along these lines. In the industrial-art and household-art courses half of the time is devoted to book work and half-time to shop work.

Minneapolis and the Junior High School

Conflicting reports come from time to time with regard to changes in the Minneapolis schools since the withdrawal of Superintendent Spaulding. The following statement from the *Tribune* of that city indicates that the junior high schools are to be retained:

Saving of a year in the time in which Minneapolis children may complete work of the present seventh, eighth, and ninth grades will eventually be possible through the plan of closer interorganization of senior and junior high schools and the reorganization of present junior high-school courses to take effect at the opening of the new semester.

High-school credit on a work-unit basis will be given by senior high schools for work in industrial and commercial courses carried on in the junior high school, it is announced.

Establishment of "guide posts" to aid junior high-school pupils to plan work intelligently and in a consistent sequence, and a closer articulation between senior and the junior high school, so the work of each will fit into the work of the other, are the outstanding features of the new junior high-school course of study, Mr. Jackson says.

Division of the work offered into three distinct classes—an academic, a commercial, and an industrial course—will mean better organization of the three years' work on the part of the individual pupil and less confusion in the grouping of seventh-, eighth-, and ninth-grade pupils in the elective classes, while it will give the child quite as large an opportunity for trying out a variety of trades and types of work as was given under the old plan of requiring certain work of every pupil and giving several options, school officials point out.

Latin will be offered in the eighth grade of junior high schools in the academic course. The work will not be high-school Latin, but will be planned as a pre-language study to help in development of the general language sense of the child to form a preparation for later high-school and college work in languages, and to aid in acquiring a rich and accurate English vocabulary.

"Elementary Latin study in the eighth grade should do for students in academic courses what prevocational courses in industrial subjects are doing for pupils in industrial courses," Superintendent Jackson said.

It should develop a language sense in those pupils in whom the language sense stands out, and give a fundamental basis for later language study, particularly in French or Latin.

The city of Chicago is enlarging its continuation vocational courses. The following statement supplied by the superintendent of schools describes these activities:

Continuation Vocational Courses

CONTINUATION SCHOOL FOR OFFICE BOYS

The Board of Education has established a down-town continuation school for boys employed in or near the loop district. On November 14 an enrolment of 75 was reported, with applications still coming in.

The persons for whom the school is intended are office boys, errand boys, and other junior clerical help. The purpose is to give an opportunity for further study and training to those who have begun clerical service with an incomplete or inadequate preparation for such work, and to give the ambitious boys a chance to prepare themselves for higher grades of service in business.

In general, the plan is to have each student attend school for one-half day each week throughout the school year, or two half-days, or such other portion of his working time as may be found to be most satisfactory to the employer.

The courses offered are such as to correct the student's deficiencies in previous preparation, and to afford him a chance to prepare for the next job his employer has in mind for him: that is, the aim is to make him more efficient. Such studies are much more effective when carried along as supplementary to the regular day's work. What is learned in school is immediately applied in practice.

The school is equipped with modern office devices such as typewriters, comptometers, adding machines, dictaphones, mimeographs, multigraphs,

filing devices, and so on, in addition to the regular equipment for ordinary school purposes.

CONTINUATION SCHOOLS IN INDUSTRIAL PLANTS

A continuation school has been organized in the plant of Swift and Company in the Union Stockyards for boys employed in clerical positions, including errand and messenger boys and all classes of junior clerical help. About 200 are now in the classes, which meet for one hour a day, each schoolday during the week. The firm furnishes the schoolroom space and equipment, and the Board of Education bears the cost of instruction.

Arrangements have been completed also for a similar school for boys in the plant of Armour and Company. About 250 boys attend, and the classes began about December 1.

SCHOOL FOR BAKERS' APPRENTICES

Apprentices employed in the bread-baking trade are attending a part-time school at the Lane Technical High School. A complete bakeshop equipment has been installed. Each apprentice attends one-half day a week. About 125 are now in attendance. Evening classes for journeymen bakers are carried on in the same plant.

TELEGRAPHY FOR MEN REGISTERED FOR THE DRAFT

Classes for instruction of men in the continental telegraph code have been organized in five evening schools and in eight industrial plants. About 400 students are in regular attendance. Only men registered for the draft are admitted. Where a class has been organized in a plant the firm furnishes the space and the Board of Education pays the teacher. The Signal Corps lends the instruments and the Board of Education instals them. The plant classes are held at the close of the day's work; the evening classes meet from 7:30 to 9:30. A practical telegrapher is employed to supervise the work. The teachers are all operators; the pay is $2.25 for two hours' teaching.

THE COURSE IN NATURAL SCIENCE IN THE UNIVERSITY ELEMENTARY SCHOOL. II

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GRADE IV

Specific aims, methods, and standards of attainment.—In this grade the pupil's acquaintance with his natural surroundings is still further extended. Much of the material is already somewhat familiar, but he makes a more intensive study of a few topics. The course deals especially with certain forms of animal life of the fields, the pond, and the home; with the plant life of the school garden and the home gardens; and with the physical conditions favorable for such animal and plant life.

In the study of animal life the aim is to acquaint the pupils first with the habitats and then with the habits and life-histories of the animals studied. For this purpose the children are taken several times to the fields, woods, and ponds, where such specimens are collected as can be kept growing in the classroom for further study. On the field trips and in the classroom the teacher aims to stimulate direct observation by asking guiding questions, the answers to which are to be given orally or in writing while observing the animals. Observation is accompanied or followed by drawing on paper or on the blackboard. Both teacher and class criticize the blackboard drawings. Later the children use models and pictures of the animals studied, as well as books.

The aquaria in the classroom contain water insects, crayfish, frogs, fish, etc.; and cages of wire and glass afford opportunities for growing and studying other insects and spiders. Cocoons are kept through the winter to enable the children to watch developments.

To take advantage of the developing sense of responsibility and ownership the children are given individual garden plots. Plans are drawn to scale for planting, and seeds are selected with the teacher's help. The child cares for his plot and owns what he is able to grow. This causes his feeling of responsibility to deepen. The problem of weeds and their relation to successful gardening becomes impressive. During the summer vacation a man cares for the garden, and so the children secure at least a partial harvest in the fall.

In the bird work it is the aim to keep active the previous acquaintance with birds and to add to the list more winter and spring birds, mainly by observation in the parks and gardens. The pupil's interest in nesting habits is fostered by observing more closely the building of nests by some of the common birds.

OUTLINE OF MATERIALS AND ACTIVITIES

A. Fall and winter work

1. Plant life
   a) Pupils collect seeds from their third-grade plot and preserve for spring planting. They observe conditions of the garden in the fall and write about them.
   b) Bulb-planting. This work is not so intensive as in the third grade, but the children plant a few varieties in pots or in the garden. Two bulbs are given each child to take home and plant; reports on results are given in class. Some bring the flowering plants to school.
2. Land-animal life
   a) Spiders. Children collect them from the gardens, fields, and buildings for classroom work, place them in wire or glass cages, and observe web-making and feeding habits.

      Paper and blackboard sketches of spiders are made.

      Some of the following are studied from life, others from pictures and books: house spiders, grass or funnel-web spiders, orb weavers or garden spiders, ballooning spiders, running spiders, jumping spiders, crab spiders, trap-door spiders.
   b) Butterflies and moths. The children bring in specimens of caterpillars, chrysalides, and cocoons. Mounted specimens also are used. Life-histories are studied.

      Silkworms and the silk industry are studied.
   c) Plant lice. Their habits. Lady beetles, the destroyers of plant lice.

d) Crickets. Live specimens are kept in cages with grass sods. Habits are studied by observation.

e) Earthworms. These are kept in a pan of soil. Some are used to feed the fish through the winter. Pupils study their habits and their value to agriculture.

f) Snails. Children collect and study land specimens.

g) Wasps. Yellow jackets and white-faced black hornets are studied, mostly from books and pictures.

(1) Nests; how and where built. Museum exhibit.
(2) How do cells open, upward or downward?
(3) Use of these cells.
(4) "Nurses."
(5) Food: honey and other sweets; also some insects.
(6) Do the wasps survive the winter? Where does the queen hibernate?
(7) Mud-daubers, jug-builders, digger wasps, and carpenter wasps.

3. Water animals

a) Children collect many kinds on field trips and keep them in aquaria. The teacher uses a canvas dip-net; as he brings the animal life to the surface the children assort it and place specimens in their bottles or cans. The specimens are taken to the school and placed in large jars or other aquaria. Children learn to feed them and observe their habits. Pupils are given a list of questions to answer on paper while observing each animal. For closer study the animals are placed in separate dishes so that small groups of children can gather about and observe them. Pictures are sketched in notebook and colored. Also blackboard drawings are made. A little story about each is written and kept in the notebook.

b) Following are some of the animals used: large giant and small giant water bugs, back swimmers, water boatmen, dragon-fly nymphs, whirligig beetles, crayfish, water scorpions, turtles, fish, water striders.

4. Household insects

The study of household insects is made not so much from an economic viewpoint as from that of sanitation.

The housefly, mosquito, house ant, clothes moth, and cockroach are studied as to life-history and habits, main structural parts, and relation to health and cleanliness.

5. Brief study of preparation of animals for winter

a) Those that hibernate.

b) Those that grow heavier hair.

c) Those that migrate.

d) Those that store up food.

B. Spring work

1. Birds

a) This work begins in the late winter with the study of winter birds (continued from the third grade) and is carried on through the spring migration. The major purpose of the bird work in this grade is to get a better acquaintance with the habits of birds observed in preceding grades.

b) When possible, trips are taken to the park to study birds. Specimens may be brought from the museum and identified.

c) Habits of birds: manner of getting food, mode of flight, hopping or walking, etc.

d) Nesting habits of the robin, blue jay, grackle, and wren.

e) Bills of birds: hooked bills for tearing food, seed bills, and pecking bills.

2. Gardens

a) Pupils have individual plots. They make a drawing of the garden to scale and make definite plans with regard to what and how to plant. Then they prepare the ground, plant the seeds, and once or twice a week until school closes they work in the garden caring for their plots and the growing plants.

b) The points discussed in connection with this work are:

(1) How to prepare the soil.
(2) How to plant the different seeds.
(3) When and how to water plants.
(4) What to transplant and how.
(5) Thinning out.
(6) Weeding.

c) The pupils are sole owners of all the flowers and vegetables raised in their plots and may sell them, give them away, or take them home.

d) When possible, field trips are made to study wild flowering plants and common weeds, such as pigweed, ragweed, cocklebur, prickly lettuce, shepherd's purse, peppergrass, thistle, parsley, etc.

A TYPE LESSON

(Detailed outline of the study of the crayfish to show method of work in class)

1. From the crayfish aquarium in the room enough of the animals are selected so that groups of four children may each have one in a glass dish for observation.

2. On the board is placed a list of questions for the pupils to answer on paper. They copy the questions, leaving several lines after each question for the answer, which is gained from observing the animal.

a) How many legs has the crayfish?

b) Describe the largest pair of legs.

c) What is peculiar about the eyes?
d) How many "feelers" has it?
e) What kind of tail has it?
f) How many parts has the body?
g) How does it move in the water?
h) How does it feed itself?

3. In the next lesson the answers given to the foregoing questions are talked over and any additional facts of general interest about the crayfish are given, such as its habitat, summer and winter; its method of carrying the eggs; method of swimming; growing new shells. Interesting articles or stories about the crayfish are read in class.
4. The children next write a paper about the crayfish, including many of the facts observed, discussed, and learned in class. The papers are corrected and neatly copied.
5. Each pupil draws the crayfish from life. The teacher makes a simple drawing of the main features on the blackboard as a guide. After one or two trials each draws one which is to be colored. Drawing paper is used.
6. Each mounts his drawing on bogus paper and hangs it up in the room with the rest until the next lesson, when it is put with the paper in his notebook.

Class time for work and preparation.—All the work is done in the class-periods. Three half-hours a week are given to the subject. No time out of school hours is required except for certain field trips.

Books used in class by the pupils.—No textbook is used in this grade for this subject. Some library books and articles bearing on the lessons are used in the class-period, and near the close of a series of lessons textbook illustrations are often inspected.

Notebooks are used for drawings of animals, for taking notes of observations, and for writing stories and life-histories.

References for the teacher.—

1. Spiders

Caldwell, *Elementary School Teacher*, March, 1910.
Patterson, *The Spinner Family*.
Hodge, *Nature Study and Life*.
Kelly, *Stories of Our Shy Neighbors*.
Emerton, *The Common Spiders of the United States*.
Comstock, *Handbook of Nature Study*.
H. Fabre, *The Life of the Spider*.

2. Insects and related topics (see list above)
   Holtz, *Nature Study.*
   Comstock, *Insect Life.*
   Miall, *Aquatic Insects.*
   Eggeling and Ehrenberg, *Freshwater Aquarium.*
   Comstock, *How to Know the Butterflies.*
   Nature Study Review, April, May, and September, 1912.
   Carpenter, *Insects, Their Structure and Life.*
   Smith, *Our Insect Friends and Enemies.*
   Darwin, *Formation of Vegetable Mold.*
   Tenney, *Young Folks' Pictures and Stories of Animals.*
   Needham, *Natural History of the Farm.*
3. Fish
   Jordan, *The Story of a Salmon.*
   Alexander's Fourth Reader, "Johnny Darter."
   Holder, *Half-Hours with Fishes, Reptiles, and Birds.*
   Baskett, *Story of Fishes.*
   Comstock, *Handbook of Nature Study.*
4. Circulars and bulletins
   Circular 5, U.S. Bureau of Entomology, *The Carpet Beetle or Buffalo Moth.*
   Circular 36, U.S. Bureau of Entomology, *The True Clothes Moth.*
   Circular 51, U.S. Bureau of Entomology, *The White Ant.*
   Circular 50, U.S. Bureau of Entomology, *Cockroaches.*
   Circular 71, U.S. Bureau of Entomology, *House Flies.*
   Circular 139, New York State Museum, *Control of Household Insects.*
   Bulletin 4, U.S.Bureau of Entomology, *Household Insects of the United States.*

GRADE V

Specific aims, methods, and standards of attainment.—For closely correlated work see domestic science outline for the fifth grade.

To connect the work of the fourth and fifth grades a fall review study of the garden is made, and seeds are collected from the plots for which the children cared during the previous spring. These seeds are preserved for future planting by younger grades. A description of the garden is written. After this a type plant, corn, is studied in much more detail than any plant in previous grades. The aim in this work is, not only to acquaint the child with germination and factors of growth, but to emphasize the uses to which such an important agricultural product is put. Such topics as the history of corn, some problems in raising corn crops, and

industries connected with corn products are included. The children become interested in the process of making some of the corn products, such as starch, cornmeal, and corn breakfast foods.

A later phase of the course includes experimentation in fermentation, with hard and soft water, with porous substances, with dissolving and melting substances, and in making butter, soap, and candles.

The garden work is made more intensive and interesting by studying soils to find their composition, how they are made, and the power they have to draw up and to hold water. Some experiments are performed in seed germination, and others to show the importance of air, warmth, food, light, and water as factors in the growth of plants. Some methods of farmers and hothouse men to fertilize the soil and to reproduce plants by cuttings and grafts are discussed.

Bird life is again studied as important to gardens, farms, and orchards.

OUTLINE OF MATERIALS AND ACTIVITIES

A. First semester

1. Fall garden study

Pupils visit the garden, study its harvest condition, and collect seeds for spring planting.

2. Corn—a type plant

a) The ear

(1) Pupils gather cornstalks from the garden with roots, ears, etc., left on. Ears of both field and pop corn are secured.

(2) Pupils examine the different ears of corn and learn the names of some good varieties of each.

(3) Characteristic appearance of dried, field, and sweet corn are noted. Details of such appearance. Good and bad ears and kernels. Average number of rows and of kernels.

(4) The cob is examined by cutting it longitudinally and transversely.

b) The kernel

(1) Pupils examine grains of different kinds of corn, both fresh and dried. They locate tip, hull, and position of germ, and remove germ and starch.

(2) A kernel is drawn showing all parts.

(3) Kernels are planted in various ways to determine vitality and to study sprouts and root systems. Sprouts with roots are sketched.

(4) Pupils grind kernels in coffee grinder to make corn meal.
(5) To learn the many uses to which corn is put the pupils look up literature, write to the United States Department of Agriculture for bulletins, and ask manufacturing companies for exhibits and pamphlets.

c) Starch
(1) Pupils perform experiments in separating starch from corn meal, flour, and potatoes.
(2) They test starch with iodine.

d) Corn as food for man: milled products and canned products
(1) Corn flakes, hominy, corn syrup, and other corn foods are studied from specimens, books, bulletins, and pamphlets.
(2) Pupils test corn syrup for sugar by using Fehling's solution and heat.
(3) Pupils test a number of foods, fruits, and vegetables for starch, sugar, and water.
(4) Corn meal. Pupils make muffins or other articles of food from it.

e) Corn as food for animals
(1) Pupils study uses of corn gluten, ensilage, cracked and whole corn.

f) Other products made from corn
(1) Corn rubber or paragol, corn-leaf baskets, corn paper, cellulose, dextrine, mattresses, pipes, cork, alcohol, and whiskey.

g) Study of stalks, leaves, roots, etc.
(1) Pupils cut stalk and examine, noting hollow stalk, pith, woody fiber, nodes, and internodes.
(2) Leaves. Made up of sheaf, blade, and ribs. Rain guard, situation, and use.
(3) Ears. Where placed? How many on a stalk? Position when ripe? How fertilized by pollen? Husks?
(4) Tassel. Its position and function.
(5) Silk. Position, and relation to pollen and kernels.
(6) Roots. Brace roots and other roots.

h) Enemies of corn
(1) Pupils look up bulletins and other literature on corn-root louse, chinch bug, corn-ear worm, fly weevil, smut, corn-ear rot, corn-eating birds, etc.

i) Importance of corn to the world
(1) Pupils look up topics and report.

j) Corn industries. Reports and discussions

k) History of corn

l) The United States corn belt. Relation of climate and soil to corn growing

m) Morning assembly exercises on corn

3. Other science topics
   a) Fermentation
      (1) Pupils perform experiments with yeast, water, and molasses to see fermentation and some of its results.
   b) Hard and soft water
      (1) Pupils determine the smallest amount of soap which will make suds with distilled water, faucet water, boiled water, lime water, and faucet water with washing soda in it. They learn that soft water forms suds easily. Application to laundering and bathing.
   c) Solubility and dissolving
      (1) Pupils test solubility in water of various substances, such as salt, sugar, starch, gelatine, soda, lime, alum, potash, chalk, glass, wood. In each case a spoonful of the clear liquid is evaporated over a gas flame to see if any of the substance was dissolved in it.
      (2) Pupils try hot water to see if it dissolves alum, etc., better than cold water.
      (3) Difference between dissolving and melting. Pupils heat salt, sugar, starch, soda, resin, lead, wax, sulphur, etc., separately in an iron pan and note results.
      (4) Pupils try alcohol, strong soda water, and soapy water to see if they dissolve things which water does not.
      (5) Pupils mix a little baking powder and cream of tartar in a tumbler. Add water to dissolve them. What causes the bubbling? Relation of this gas to the making of bread?
   d) Milk
      (1) How keep it sweet? Pupils put a little milk into several clean bottles. Leave one open in room. Put a pinch of borax into second and leave in room. Put a third in the refrigerator or other cold place. Pasteurize a fourth. Examine each for a few days and determine the order of souring.
   e) Fats
      (1) In butter-making. Pupils make butter from simple directions.
      (2) In soap-making. Pupils make a simple soap and use it.
      (3) In candle-making. Pupils make candles by molding and dipping processes.

B. Second semester
   1. Soil study

      To get a concrete idea of what soils contain and the factors which help in making soils fertile, several simple experiments are performed by pupils. This work amplifies soil study of the Fourth Grade.

   2. Plant reproduction
      a) Pupils review propagation by bulbs, seeds, tubers, etc., and then propagate by

(1) Cuttings. Using a few of such plants as geranium, wandering Jew, coleus, begonia, rose, fuchsia, carnation, willow, lilac, grape, the pupils plant some cuttings in very sandy soil. They transfer to pots when well started. Some cuttings are tried in glasses of water. Advantages of this method?
(2) Grafting. Cuts in twigs or stems are made to show how grafting is done.
(3) Runners and roots. Pupils bring in samples.
(4) Underground stems and layering. Examples and methods are shown.

3. Garden work
   a) Early in the spring pupils draw plans of individual plots to scale, and decide upon what seeds to plant.
   b) When ground is in condition pupils prepare their plots, plant seeds, and care for their gardens until school closes. A man cares for the gardens in the summer so that the children will have a harvest in the fall. Most of the pupils do not spend the summer in Chicago.
   c) In this grade each pupil is held responsible for industry and care in the cultivation of his garden.

4. Bird study
   a) Review of birds studied in preceding grades.
   b) Occasional trips to park to study birds.
   c) Economic factors
      (1) What and how much birds eat.
      (2) Feeding places of birds and feeding habits.
      (3) Relation of bird life to agriculture, horticulture, and gardening.
      (4) Bird and game laws.
      (5) Migration of birds.

A TYPE LESSON

1. Simple analysis of soil
   a) Pupils weigh, in iron pans, 100 grams of garden soil and heat gently to dry out moisture. Estimate amount of moisture by weighing again.
   b) They heat the soil again strongly to burn out the organic matter and estimate amount by weighing.
   c) Next they sift the soil through coarse and fine sieves to separate gravel, coarse and fine sand, and silt. Each is weighed.
   d) Some of each ingredient is put into bottles which are mounted on cardboards and labeled.
   e) If there is time the pupils bring soil from home and from different regions and analyze.
   f) Pupils put seeds or plants in some of the ingredients found in soil to see if they will grow.
   g) Pupils examine, with lens, some sand, loam, and humus.

2. Water-holding power of soils
   a) Pupils put equal amounts of sand, clay, and garden soil into separate lamp chimneys, tie cheesecloth over bottom, and suspend chimneys over glasses. They pour equal amounts of water into the chimneys and observe which lets water through first, and which absorbs and holds the most water.
   b) Of what importance is this to plant growth?
3. Water-lifting power of soils
   a) With same kind of soils in chimneys as in 2, above, pupils stand the chimneys in glasses which have equal amounts of water in them. They observe the water rise, and note the amount taken up in each case.
   b) Is this a factor in plant growth?
4. Film of water on particles of soil
   a) A bottle is filled with lead shot and water and then the water is strained off. The film of water on each shot illustrates the way in which soil holds water.
5. Mulching
   a) To show that mulching keeps water from evaporating so fast from the soil, pupils put soil in two bottles and thoroughly wet it. The wet soil in one bottle is covered an inch deep with dry loose earth. Each bottle is weighed on successive days. Which dries out first?
   b) Application to gardening and farming.
6. Capillary water
   a) Pupils perform simple experiments with string or wicking, lumps of sugar, and water to understand something of capillarity.
   b) Application to soil water.
7. How soil is made
   a) Discussion of beginnings of soil formation. Effects of running water, temperature, winds, plant and animal life, wave action, glaciers, landslides, etc.
8. How soil is carried
   a) Readings and talks on the effects of water, wind, glaciers, landslides, etc.
9. Kinds of soil
   a) Pupils study sandy soil, clayey soil, gravel, humus, and loam. Distinctive features of each.
10. Soil replenishment
   a) Various ways of enriching the soil. Rotation of crops. Relation of clover, alfalfa, etc., to soil replenishment. Overflowing of river banks.

11. Soil conditions favorable to plant growth
   a) Pupils do simple experiments with potted plants to determine whether the plants need
      (1) Air
      (2) A certain temperature
      (3) Food
      (4) Light
      (5) A certain depth of planting
      (6) Water

Class time for work and preparation.—All the work is done in the classroom periods. Two hours a week is allotted to this subject, divided into hour and half-hour periods. No home work or outside preparation is required. Closely correlated is the work in domestic science in which two hours per week for one semester are allotted in this grade.

Books used in class.—No textbook is used for elementary science in this grade. Articles and books (see "References") are occasionally used in class.

Notebooks are kept in which the pupils write brief descriptions of experiments and important facts learned from class work. This gives needed experience in the written form of expression.

References for the teacher.—

1. Corn
Corn Day Annual, Superintendent of Illinois Schools.
Eleventh Biennial Report of South Dakota Schools.
1912 Year Book, Superintendents' and Principals' Association of Northern Illinois.
Corn and Its Uses, American Manufacturers Association, Chicago.
Government bulletins, state bulletins, and circulars.
2. Soils and plant life
Gaye, *The Great World's Farm.*
Carpenter, *How the World Is Fed.*
Comstock, *Handbook of Nature Study.*
Gifford, *Practical Forestry.*
Bailey, *Principles of Agriculture.*

[*To be concluded*]

DIAGNOSTIC MEASUREMENT AS A BASIS FOR PROCEDURE

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About four years ago, the writer was introduced to modern methods of measurement in education and straightway became a conscientious objector to the proposed use of the new ideas. Further study and a closer acquaintance with standard tests and scales led to serious experiments, and these in turn have produced a thorough revision of the theory and practice of her teaching.

Previous to this experience, the writer was in accord with the theory that a good method invariably reduced the variability among members in a class, and tended to produce a closer grouping about a mean or average. This conception fostered the practice of forcing the exceptional pupil to keep pace with his class. Each lesson was gauged to average ability, and extra attention was given to the least capable members of the class. Equality of attainment was recognized as impossible in actual results, but as the end to be aimed at. The progress of the class as a unit was the aim of instruction.

Now, however, it appears that there is a great waste of effort and time in trying to keep a class together. There is no doubt that close grouping is desirable from the point of view of the school system, but if, in realizing this aim, the welfare of the individual pupils is made secondary to the maintenance of a system there is room for improvement.

Divided classes reduce the waste somewhat, but nothing short of individual instruction seems right in theory. The question at once arises, How can such theory be put into practice? Is it not impossible to furnish individual instruction under class-room conditions? The experiments which invalidated theories long held also suggested possible procedures. These were tried out and evaluated according to improvements resulting from their adoption.

A brief report of the work done and graphic records of actual measurements of improvement are submitted. They are evidences of the practicability of individuated instruction under classroom conditions, and show how valuable standard tests and scales are in initiating the new procedures. The present article is confined to a study of reading, but similar changes of method have been found productive in other branches, especially in spelling and arithmetic.

Although the class under consideration consists of but twenty boys, the writer is inclined, from previous experience with much larger groups and mixed classes, to believe that the methods used would be both profitable and practical in such classes as well.

A STUDY OF READING

In October pupils were tested to ascertain the oral- and silent-reading rate of each individual. Five oral and five silent trials were made, and the averages obtained and used as measures of reading rate. The pupils were then asked to read as much as possible in a minute without making any mistakes. With but one exception the rapid readers made fewer mistakes. Comprehension was tested informally. Rapidity and comprehension seemed to go together. Intensive instruction was given. Especial attention was paid to poor readers. After two weeks there was no improvement in the rate of the three poorest readers. The only noticeable improvement was made by the better readers. It was evident that the least capable were getting the least from instruction though receiving more attention. This presented a problem. Why did they fail to improve? They were questioned. Not one of them liked to read. Not one did any reading except when forced to do it. They liked to listen to stories. How could they be reached?

The psychology of reading was studied for possible solutions of the problem. This took time but gradually the following conclusions were reached:

1. There are certainly other phases in the subject than the mere ability to pronounce words suggested by their printed symbols.

2. Perhaps this phase of reading is overemphasized in the lower grades. A great many methods have been devised for use in teaching the mechanics of oral reading, while very little attention

has been given to the reading problem beyond this mechanical stage.

3. The grading of reading material has not introduced new problems but enlarged the elementary problem. The subject-matter is made more difficult, the vocabulary more formidable, and expression requirements are set higher. Nevertheless, the reading is judged largely by its sound. An analysis of difficulties in concrete arithmetic, geography, and history indicates a poor quality of reading which could not be detected by its sound. The results of recent surveys point in the same direction.

4. As the use of textbooks increases through the grades, the ability of children to get *meaning* from the printed page should assume great importance and be the aim of reading instruction. Anything which conditions comprehension is then of value in reading, and whatever methods build up ability in comprehension most rapidly are most economical.

5. No one method is necessarily adapted to all individuals, as there are such diverse causes of failure, but the methods must be based on the psychology of the reading process.

6. The earlier right reading habits are formed, the better for the child. The unit of meaning is the phrase. Therefore it should form the unit of instruction in reading as early as possible.

7. Word study to increase the visual vocabulary is no doubt productive, but extensive reading may have the same effect and be more profitable from other points of view.

8. Interest and attention no doubt condition maximum effort in reading. Good readers should not be asked to keep to the reading pace of struggling readers, as is the case in many oral reading lessons. Keeping the place, when the attention is urging a reader on, causes indolence and works against the formation of worth-while reading habits.

9. Instead of working with one child at a time, while other members of the class wait their turn, reading silently at the oral rate of the child who happens to be reading orally, the members of the class should be grouped, according to their reading defects, into many small groups. Similar groups may be taken together for some lessons, but good readers, who do not need much help with

oral reading, can be profitably employed in improving the quality of their silent reading on new material.

10. A definite diagnosis of individual traits in reading should form the basis of grouping. Every trait which influences reading habits can in turn be influenced by definite training and special practice.

11. Extensive reading must fit the child's present ability and enlist his interest.

The foregoing conclusions formed the basis from which a system of training was devised. Ten types of instruction were planned to cover as many individual needs. The class reader was supplemented by a carefully selected list of books for extensive reading. Methods were devised whereby maximum effort would be called forth and interest sustained. Rate was found to be a measure of improvement which the children could comprehend. They were therefore made aware of their rate of reading and kept graphic records of their individual standings in monthly regrouping tests. "A" readers were those whose rate was more than thirteen lines per minute. They were given the privilege of selecting their own material from the supplementary book shelf for silent reading. This shelf was called "Story Row." The books were arranged in groups according to content. A regular library system was used so that the teacher could ascertain at any time what each child was reading and what he had finished. The quality of the silent reading could thus be revealed by conversation with the pupil. Children who had enjoyed a book were asked to review it for others who might care to read it. Favorite chapters were illustrated. Some children chose informational material. They would recount interesting things which they had learned from their reading, and create a great demand for the book which they had read. No more than two books could be used by a pupil at one time and *stories* had to be finished before another *story* book could be begun.

"B" readers were those whose rate was more than nine lines per minute but not more than thirteen. Pamphlets were provided for their supplementary reading. The material was easier and the content quite suited to their comprehension. Otherwise the system used for the "B" readers was like that for the "A" groups.

They had *less* time for supplementary reading as they required more intensive work with the teacher. Their pamphlets were very popular and were often read by "A" readers.

There was also a group called "C" readers whose rate was between six and nine lines per minute, and another group of "D" readers who read even more slowly and got practically no meaning from the subject-matter. Their supplementary material consisted of separate stories. These they read with the teacher, alternating with her. They liked to have stories read to them. The teacher used her book. The group looked over her shoulder and kept the place, picking up the story and reading on when she stopped, until the end of a paragraph was reached. The meaning was then discussed and the reading continued.

Each child in the class subscribed to a little nature magazine which was kept in the desks for reading during odd minutes. Several other magazines, an atlas, and a file containing good original stories by the children were also at their disposal for this purpose.

The regular reading instruction was the visible means by the aid of which each pupil hoped to get into a group higher than his own by the next measurement.

These groupings were based on rate and were not identical with those made for corrective teaching. The procedures just described together with the intensive teaching in type lessons which follow were jointly responsible for improvements in reading rate and quality. This report would therefore be incomplete if detailed descriptions of methods used to secure the interest of the individual child were omitted.

TYPES OF INDIVIDUATED INSTRUCTION

Type lesson 1.—All look at the first phrase, looking up when they reach a comma or a period. When the entire group is looking at the teacher she nods and they repeat the phrase. She watches individuals to find their difficulties, but does not interrupt. When they have said all but the last word of the phrase they again look down, silently getting the next phrase and looking up, holding the phrase in mind until all are ready. Again the teacher nods and the group gives the phrase orally, looking down at the last word and continuing this procedure to the end of the paragraph or section. The intensive study calculated to improve poor readers can be made to yield a double return, if instead of selecting hard words and subjecting them to analytic study the unit

is the phrase or group of words which expresses an idea. Instead of working at a difficult word, the phrase in which it appears is studied until mastered. Instead of working with one child at a time and giving each child only a few minutes of actual oral reading, four or five of those who have similar ability are grouped together, while other groups of poor readers follow silently. Third-grade material or very simple fourth-grade material is used for this purpose.

While other pupils are being tested the ones who have had Type 1 answer mentally or in writing blackboard questions concerning the material of their lesson. Occasionally duplicated sheets containing uncompleted sentences or a story are used instead, the children filling in the blanks mentally or in writing.

Type lesson 2.—Eye training and *focus.* Field of vision enlarged to include several words rather than one. First, by having the book far enough from the eyes. Secondly, by eliminating the use of a finger or other place-keeping device. Thirdly by work with flash cards, flashing phrases, trying to get a phrase at one flash, and counting the number of flashes needed for each phrase. These phrases were cut from current printed matter and mounted on small cards. Written sentences directing children to perform certain activities were also used as flash material. The one who first read the direction carried it out. The one who had three such opportunities in succession was given a sheet with similar work for silent reading and could return to the group when finished.

Type lesson 3.—Silent reading for the purpose of oral reproduction and comprehension.

Type lesson 4.—Silent reading in search of a given phrase, answer, idea, or suggestion in the content of supplementary books, geography text, arithmetic text, and blackboard work.

Type lesson 5.—Differentiation for pupils who confuse similar words or miscall syllables, guess at words, or omit endings. Lists like the following form the basis of such work. Lists are compiled from actual mistakes made by children.

that	woman	beautifully	swimming
when	every	prettiest	board
what	never	prettily	close
then	even	probably	chose
how	ever	lovingly	lying
who	very	companions	buying
their	these	understand	tired
there	those	understood	tried
than	now	laughingly	certain
women	know	quietly	curtain
man	beautiful	left	felt

Type lesson 6.—Lessons in accuracy for those who make errors, substitutions, and omissions; reading a page orally and counting errors, or reading until they make an error to see how many lines they can read perfectly.

Type lesson 7.—Breathing exercises. Children taught to breathe rhythmically at ends of phrases or clauses instead of breaking the smoothness of oral reading. Practice in breath control is thus related to the problem of meaning and interpretation. Abdominal breathing taught.

Type lesson 8.—Articulation exercises for mumblers, or those with other bad speech habits.

Type lesson 9.—Voice work and expression. Unpleasant voice quality and monotony corrected by special practice and training. Children are taught to vary meaning by change of stress and to show relative importance of ideas similarly. Punctuation is studied for the same purpose.

Type lesson 10.—Word study, with difficult words, for ready recognition, pronunciation, and comprehension. Word building and word structure studied.

A blank form similar to the one in Fig. 4 was used during a week of diagnosis. No regular test was used, but methods similar to those used in all available tests were combined in efforts to diagnose each individual. By the end of the week the teacher was able to determine which types of instruction would be needed by each individual. The amount of instruction needed could not be determined until the effects of practice were measured. Four types of instruction could be given in one period by systematic planning.

Aside from the foregoing types of individuated instruction designed for use with small groups, informal dramatization and illustration of parts of reading lessons were given as class exercises. Tableaus and pantomimes were informally arranged from parts of stories. Poems were studied, paraphrased, and read from memory. Words which called up pleasant pictures were selected from descriptive poems. Phrases which were beautiful or pleasing to the ear were used in original sentences.

Beautiful selections from literary masterpieces were read to the children. Interesting incidents from the lives of great men were told, and reading matter provided containing simple biography. Children were taught the use of alphabetical index, table of contents, and cross-references by practice in finding desired information from their own textbooks and by selective reading from magazines.

These varieties of instruction were no doubt of value in securing unflagging interest and active attention. The individual's record was a device calculated to contribute to this end. The purpose of instruction was evident to the child.

Results are appended and may be compared with available data.

Fig. 1 shows the distribution in oral-reading rate during six successive months. The base line represents lines read per minute. The lettered blocks represent individuals. The group divisions are shown by vertical lines. Thus pupil O was in group "D" and read five lines per minute in November, moved to group "C" in December, and was reading nine lines per minute. In January he read twelve lines per minute and was in group "B." In February he read thirteen lines per minute but did not get into group "A" until March. The class median is indicated in each distribution. The reading rate is an average of from three to five trials on as many selections of unstudied material from the Horace Mann reader. No rate of measurement was made in April, as other reading tests were conducted. Fig. 2 gives distributions in silent-reading rate.

The final oral measurement is given in the individual records, which are found in Fig. 3. Here the base line indicated months (November, December, January, February, March, and May). The vertical shows lines read per minute. Each block is the record of the pupil who is designated by the initial. The dotted line in each record is the class median and is inserted for purposes of comparison. Thus pupil J read eleven lines per minute in November and was above the class median. He improved but not as fast as the class, for he fell below the median in December. In January he took his old position above the median by improving in rate of reading and in rate of improvement. At the same time he surpassed the standard set for "A" readers and went on improving without further intensive instruction. The length and shape of the various curves tell their own story.

Fig. 4 shows how much of each type of training was given each individual to produce the improvement. Each type of instruction is indicated at the left. The pupils are designated by letters. Each vertical line indicated about one week of training of a specified type. This means about fifteen minutes a day for four days, not always consecutive. At the bottom of the figure absence is indicated, a horizontal line representing one week of absence. This explains why some poor readers did not receive more of certain

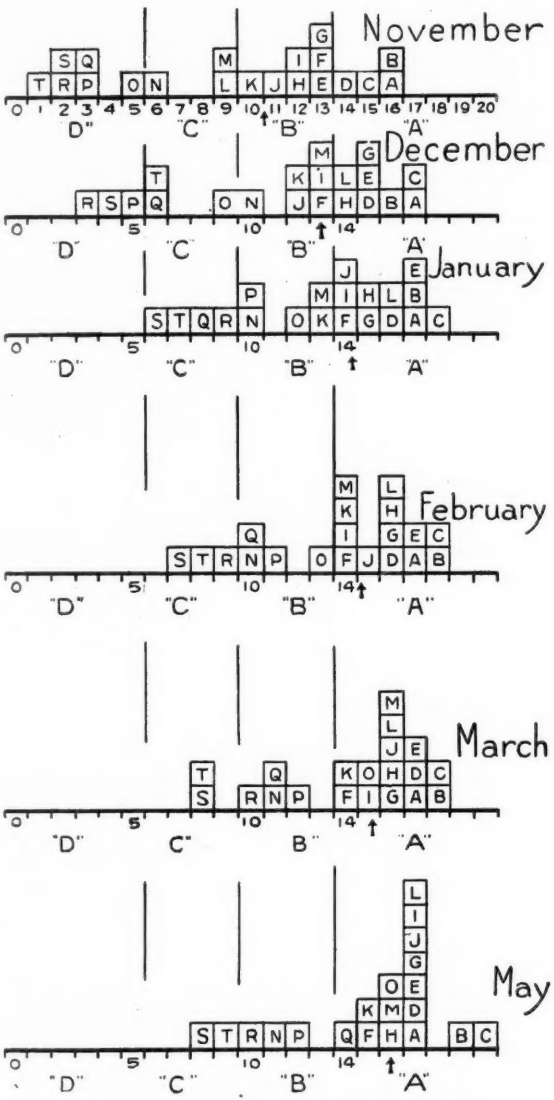

FIG. 1.—Distributions. Oral-reading rate. Lines per minute

needed types of instruction. *It will be remembered that class instruction is not shown* because it was the same for all. Only one lesson per week was devoted to class work as a rule.

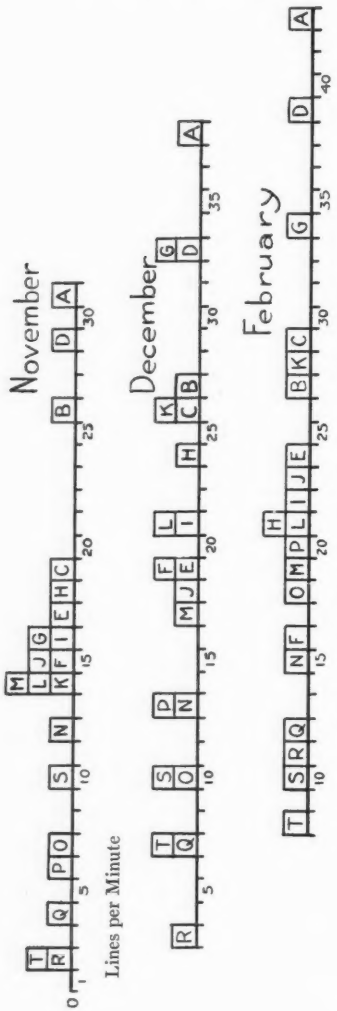

FIG. 2—Silent-reading rate. Grade IV. Distributions

The types of instruction most needed by pupils, whether good or poor readers, are types 3 and 4. Individual difficulties are very noticeable, especially in types 6 and 7. Types 1 and 2 are evidently very essential to poor readers; types 8 and 9 show the effect of previous training. Type 10 was needed by all but exceptionally facile readers, who instead kept a list of words which they wanted to look up in the dictionary and used the time given to the remainder of the class as a whole for that purpose.

The extent of reading evidently influences ability greatly. The rate, in turn, greatly limits the extent and the desire to read. These interrelations are suggested by Figs. 2, 5, and 6.

In Fig. 5 we notice that in October and November the average number of pages of silent supplementary reading per pupil during school hours was sixty, in December and January it was one hundred seventy-six, while in February and March it exceeded three

hundred pages. This graph is supplemented by Fig. 6, which shows the extent and quality of material read by individuals at home from October to April inclusive. These lists were accurately reported and include only reading matter which was done independently by the child. The influence of various types of extended reading is thus shown.

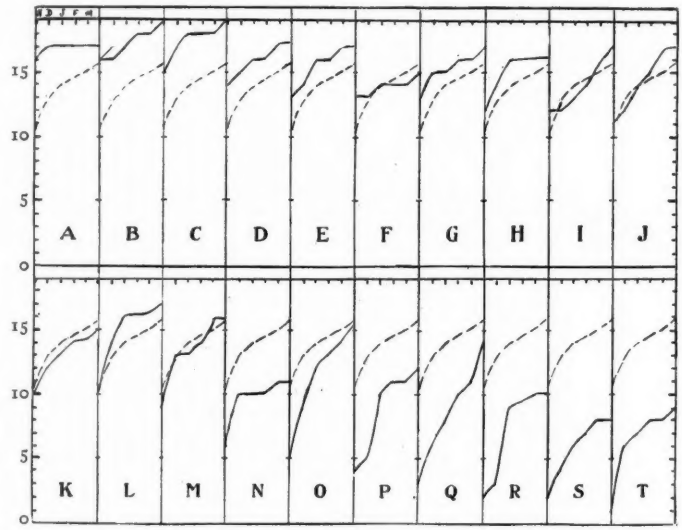

FIG. 3.—Individual records. Class medians. November–May

Thus E, who reads a great deal at home, has chosen such exciting and second-class material that it has been harmful rather than helpful. He evidently reads for the sensation derived. He has no taste for better material and is hard to interest except in competitive work. Type lessons 3, 4, and 6 were what he needed most (Fig. 4). He was the only fast reader whose articulation was poor. A great amount of absence, due largely to minor illnesses, makes his record incomplete, but suggests a possible correlation between emotional attitude and physical tone. Pupil F read a great deal, but most of his reading was very simple. He has a very active

Type 1–10	Pupil																			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1. Flash phrasing			2	1	2	2	2	3	1	2	2	1	4	5	5	5	5	5	5	5
2. Eye habits	1	1	3	1	2	2	3	2	1	2	1	2	1	2	4	4	4	4	4	2
3. Silent for meaning	2	2	2	2	3	2	2	2	4	3	4	2	2	4	4	5	5	5	5	4
4. Silent search for given idea	2	3	2	2	3	2	3	2	4	3	4	2	2	3	4	5	5	5	5	4
5. Differentiation of words	1	1	1	1	2	2	2	3	2	1	1	4	2	3	2	4	4	4	5	4
6. Errors—omission-subs	1	1	2	1	5	4	1	5	3	1	1	5	1	1	1	2	4	2	5	2
7. Breath control						2	1	5			2			5	2	1	1	1	1	
8. Articulation					2					1		1	2	1	2	1		1	3	1
9. Voice and expression	1	1	1	1	1	3	1	1	3	1	1	1	1	1	3	1	2	2	1	2
10. Vocabulary word-study	2	3	2	2	2	2	2	3	2	3	3	2	3	3	3	3	2	3	3	2
Absence	3	3	3	3	3	3	3		3	3	3	3		3			3		3	3

Fig. 4.—Relative Amounts and Types of Individuated Instruction Given in Group Work

mind and home reading for him is a form of relaxation. His errors are due to his ability to forecast the probable outcome. He gets the meaning but changes unimportant words or omits them and often stops in the middle of a passage of oral or silent reading to give an opinion or relate an experience. He is very hard to handle in class instruction because of his highly developed associative habits of mind, but is without doubt a very promising pupil. When not reading for relaxation, his favorite book is an atlas or encyclopedia.

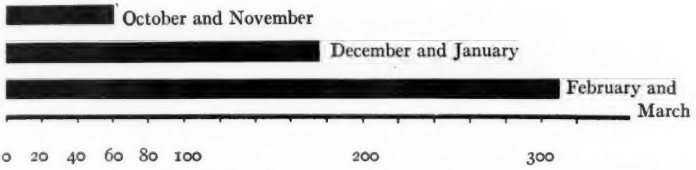

FIG. 5.—Average number of pages of silent reading per pupil (during school hours). Supplementary material.

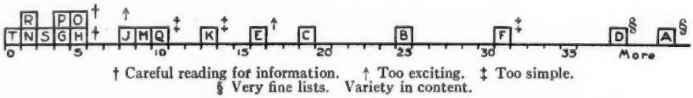
R P O † ↑
T N S G H † J M Q ‡ K ‡ E ↑ C B F ‡ D § A §
0 5 10 15 20 25 30 35 More
† Careful reading for information. ↑ Too exciting. ‡ Too simple.
§ Very fine lists. Variety in content.

FIG. 6.—Report of home reading, October–April (number of books read)

Pupil H had a queer habit of not stopping for breaths, but gasping indistinct words on inhalations and reading clearly on exhalations. He got very little meaning from oral reading and if questioned would ask for permission to re-read silently for meaning. He had carried over his breathing habits from silent to oral reading, without making any readjustments. In free discourse his conversation was well intoned and pleasing. In reading he often emphasized the words which had no expression value. Type lesson 7 cleared up the whole matter.

The variation in the amounts of training and practice needed to correct similar faults in different pupils not only shows individual differences in native ability but also in mental inertia. Some pupils never knew their own powers because they had not been

roused, but allowed to putter away at a very low level of attention. This accounts for some very rapid improvement. A pupil who in three years of school life develops the ability to read only five lines per minute must tap new mental resources to triple his rate in four months (pupil O).

Other correlations are shown in Figs. 7 and 8. The base line is divided into twenty spaces lettered for the twenty pupils. The vertical is the achievement record. The degree of correlation is revealed by the similarity of the lines in each graph. For instance, the lines for oral and silent rate indicate a partial but significant

FIG. 7.—Oral reading. Oral reproduction

correlation. There seems to be an increase in individual variations as rate increases. Improvement in oral rate is not always coincident with improvement in silent rate.

There is no scale whereby the personal attitude toward reading can be measured, but measurement certainly does not appear to have had any detrimental effect on attitude, in this experiment.

One end of reading instruction is reading ability, but the greater aim is to formulate and foster the desire to read, by providing an ample supply of good supplementary material and an opportunity for individual selection and silent enjoyment.

The study has resulted in definite conclusions which will influence the writer's method of instruction. Most of the conclusions based on a study of the psychology of reading as stated in former pages were confirmed by experiment. The efficiency and

economy of instruction are very dependent on (1) individual diagnosis, (2) individual remedial work, (3) thorough analysis and regular measurement of individual improvement, (4) motivation, (5) provision for suitably graded extensive reading, (6) system in application of diagnostic tests and remedial work, (7) correct valuation and proportional stress on various types of reading,

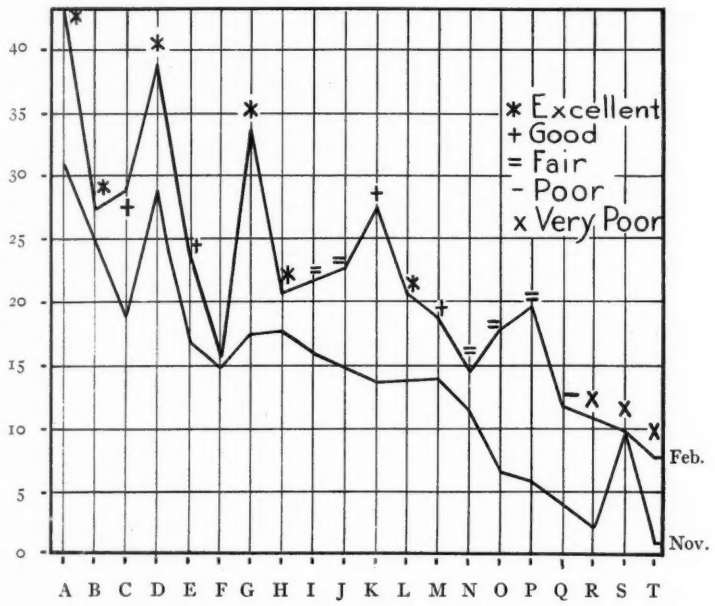

FIG. 8—Silent reading. Written reproduction. Relation of rate to quality

(8) a realization that *special* habits cannot be formed by *general* training and practice.

Several of the standard reading tests were applied in April and May to test the validity of methods employed by comparing results with norms and means. Unfortunately there are very few tests which can be applied more than once without losing their test value, on account of the effects of familiarity and practice. Other tests are designed primarily for supervisory rather than diagnostic

purposes and therefore are not so reliable for the measurement of individuals. Nevertheless available tests were applied and are submitted for what they may be worth in combination.

Class score, Gray oral-reading test	49.4	
Grade IV, Cleveland median score, Gray oral-reading test	47.22	
Grade IV, Cleveland average—all boys, Gray oral-reading test	45.	
Class score, median time to read 100 words silently	27.2	sec.
Cleveland Grade IV	34.5	sec.
Class median score, Kansas silent-reading test, comprehension	18.15	
Fourth-grade norm (1915–16)	9.4	

The class score in this test falls between the seventh- and eighth-grade norms. Eighty per cent of the class had scores higher than 12.5.

Individual scores were:

A	B	C	D	E	F	G	H	I	J	K
20.5	21.6	23.8	20.2	20.8	18.9	19.7	19.1	19	17.3	12.6
L	M	N	O	P	Q	R	S	T		
21.6	16.1	14.6	14.2	6.1	13	2.9	6.8	2.6		

THORNDIKE'S READING SCALE *A:* VISUAL VOCABULARY

Class score 6.09

Rank of individuals:

11	10	9	8	7	6	5
A	D	B	G	C	E	R
			M	F	K	S
				H	N	T
				I	O	
				J	P	
				L	Q	

THORNDIKE'S SCALE ALPHA A

Class score 6 (understanding of sentences)

Rank of individuals:

8.41														5.13	4
C,	M,	D,	A,	J,	G,	E,	H,	I,	B,	N,	Q,	O,	K,	R,	S
			F					L						T	
														P	

The class score falls between L and B.

Eighty per cent of the class had scores above 5.25. The median time for tests 1, 2, 3, and 4 was 18 minutes.

The ten highest scores were made by pupils who used median time or less.

Pupil C was really not tested to his limit. He had a perfect score on one test usually given only to seventh- and eighth-grade pupils.

CLASS MEDIANS

Words per second, Horace Mann Reader IV:

Oral November	1.8+
Silent November	2.4+
Oral March	2.6+
Silent March	3.6+

Starch reading tests (for written reproduction):

Average words per second 2.59 (silent)

Average words reproduced from 30 seconds of reading 34.2

Oberholtzer and Courtis investigations resulted in a reading rate of 2.6 words per second silently. Starch fourth-grade average is 2.4 with a reproduction average of 28 words. Oberholtzer gives 2.3 words per second as a fourth-grade standard in oral reading. Differences may be due to purpose of reading, which influences rate.

The New Courtis Silent Reading Test, Form "B," was not applied until after the summer vacation and two months of further instruction.

The median scores were: Words per minute, 189.5 (per second, 3.16). Questions answered in 5 minutes, 42 (yes or no). Index of comprehension, 94 per cent.

A different set of habits or reactions is called forth for oral than for silent reading. Varying rates are desirable for various purposes. A preponderance of any one type of reading practice tends to lower the efficiency in neglected types, i.e., if careful reading is pursued to the exclusion of rapid silent reading for general appreciation, the reader will lose the ability to profit by rapidly scanning material of little value and selecting passages for careful reading. Both abilities are valuable and must be cultivated.

There is a point beyond which rate becomes insignificant as a measure of ability, but *silent* reading does not appear to be effective until a rate of 1.3 words per second or 80 words per minute is approximated in *oral* reading. At this point silent reading seems to free the attention from vocalization and permit an increase in the amount grasped at one glance. This in turn reacts on the

oral-reading rate. It is then important to cultivate proper habits of silent reading before a child is expected to use a textbook for silent study of informational matter. A silent-reading rate of less than 15 lines or 120 words per minute is unsatisfactory, and highly correlated with insufficient comprehension. Extensive reading cannot be expected from pupils who have not approximated this silent rate. These are not arbitrary convictions but rough estimates based on the experiment here recorded.

This study was not conducted by a specialist, but by a grade teacher interested in the advancement of the class through methods which reach the individual members. No time was taken from other studies. In fact a similar experiment in individuated instruction was simultaneously carried on in spelling, arithmetic, and penmanship. The results were tested and are evidence that no one subject was overstressed. The time economy, resulting from scientific procedure, also made possible a fulness and breadth of teaching usually thought incompatible with standardization and educational measurement.

THE INFLUENCE OF INCREASING DIFFICULTY OF READING MATERIAL UPON RATE, ERRORS, AND COMPREHENSION IN ORAL READING

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Texarkana, Arkansas

MATERIAL AND METHOD

The purpose of the investigation here reported was to ascertain the effect of increasing difficulty of reading material in oral reading (1) upon the rate of reading, (2) upon the types of error made, and (3) upon the degree of comprehension. No previous investigation has made these problems the chief questions for consideration, but indirect contributions have been made by Oberholtzer, Schmitt, Bowden, Gray, and perhaps others. The present study was made with 238 pupils distributed through the elementary grades as follows: first grade 29, second grade 29, third grade 30, fourth grade 27, fifth grade 30, sixth grade 32, seventh grade 30, and eighth grade 31. These pupils were in each case members of the advanced section of the grade and were so chosen as to avoid a group selected on the basis of ability.

Of all available material that which most fully meets the needs of such a study is Gray's *Standardized Reading Paragraphs*. These paragraphs were therefore chosen for this investigation. The test is composed of twelve unrelated paragraphs increasing in difficulty from the first to the last. They were standardized for oral reading by Dr. William S. Gray through a long process of experimentation which included the testing of several thousand school children. Being thus standardized from the point of view of increasing difficulty for oral reading, the paragraphs are particularly well adapted to the study of the rate of reading and the types of error. The material, however, is not so well adapted to the study of comprehension. The paragraphs have not been standardized as to thought-content, and their relative difficulty in this respect is not known.

The procedure followed is an adaptation of the procedure outlined in the instructions which accompany the original test. Only such modifications were made as were necessary to meet the purposes of the study. The pupils were tested individually in a quiet room with no one present but the observer and the pupil. A record was made in each case of the errors made and the time required to read each paragraph. The errors considered were those designated by Gray, namely, gross mispronunciation, minor mispronunciation, omissions, substitutions, insertions, and repetitions. Each pupil was allowed to continue reading until he had made seven errors in each of two paragraphs, or five errors with a reading time of forty or more seconds. A test of comprehension was also made for each paragraph immediately after the reading. This was done by means of questions. Through preliminary experimentation five questions were derived for each paragraph, and each question was given a score value of 20 per cent. The answers were scored as 5, 10, 15, or 20 per cent according to the degree of correctness.

RESULTS

The rate of reading.—Fig. 1 presents the rates as found for each grade on each paragraph read successfully by four or more pupils of the grade in question. As here used, to read a paragraph successfully means to read it in less than forty seconds with less than seven errors or in forty or more seconds with less than five errors. The diagram presents a curve for each grade, which shows the average rate in words per second on each paragraph read successfully. The figures at the left indicate the rate, and those at the bottom indicate the paragraphs.

In the case of the first two grades it is evident that very serious difficulties are present from the beginning. This is indicated by the relatively low rates at which the pupils of these two grades begin reading and the fact that there is a decrease in the rate from the very first. The words cannot be recognized so rapidly as they might be pronounced. Hence the rate of recognition is the factor which here determines the rate of reading. The pupil finds it necessary to pause and study many of the words in order to discover

a clue as to their pronunciation. As the number of difficult words increases, there is a corresponding increase in the number of pauses. This hesitation in the recognition of words, as contrasted with immediate reaction to familiar cues, obviously causes a decrease in the rate of reading. In the third grade and above there is little or no decrease in the rate of reading for the first four paragraphs, because

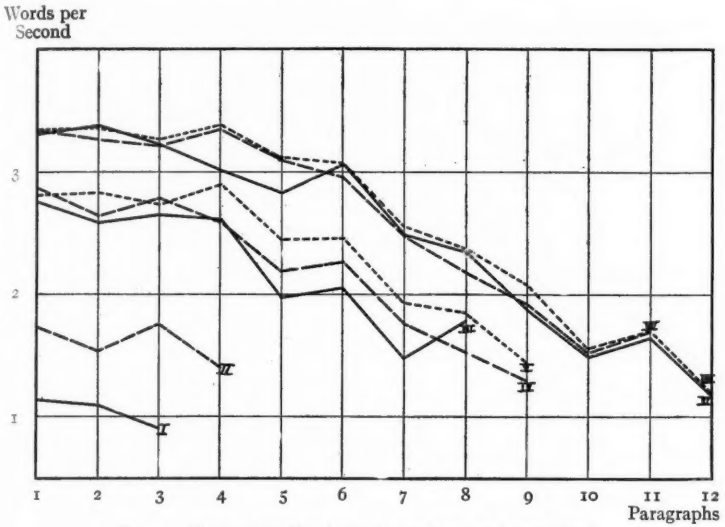

FIG. 1.—Rate of reading for each grade on each paragraph

these paragraphs present few difficulties. Rate of recognition is in advance of the rate of vocalization or on an equality with it. Reading proceeds at what may be said to be the normal rate of the pupil, which is determined by the pupil's natural rate of vocalization and by reading habits that have been formed. These become the determining factors of the rate of reading. The decrease in rates beyond paragraph 4 indicates that the increasing word-difficulties have resulted in a situation similar to that of the first two grades. That is, the word-difficulties have so decreased the rate of recognition that it has fallen below the rate of vocalization, and has thus become the factor upon which the rate of reading depends.

If comparisons among the grades are made, two facts are apparent from the diagram. The first of these, indicated by the different levels at which the curves begin at the left, is that there is a rapid increase in the rate of reading from the first grade to the third, and from that point on a more gradual increase. The second fact to be noted is that regardless of the degree of difficulty the pupils of the third, fourth, and fifth grades read at about the same rate, and those of the sixth, seventh, and eighth grades read at about the same rate. This is indicated by the fact that the curves of each group are very close together throughout.

Both the manner of increase and the similarity of rates are to be explained on the basis of the status of recognition, which is probably universally characteristic of the successive stages of reading ability. In the first two grades the child is learning to recognize the symbols for words which are already a part of his spoken vocabulary. His rate of reading in this period improves rapidly, for he has but the one task of associating printed symbols with familiar word-sounds. In the third grade his reading vocabulary probably overtakes his spoken vocabulary, and the additional struggle with meanings interferes with the automatizing of the process of word-recognition and so holds up for a time further increase in rate. This task of acquiring meanings is prominent also during the fourth and fifth grades. The situation is further complicated by the fact that the pupil of these grades is being called upon to form the habits of silent reading in order to meet the requirements of his other studies. The scattering of interests in this way undoubtedly causes a break in the formation of habits in oral reading. As the pupil becomes acquainted with more and more words and their meanings, and the habits of silent reading become more or less fixed, opportunity is given for another increase in the rate of oral reading. This increase we find in the sixth grade. After the increase at this time, the training of the school and the physiological limitation of the organs of speech prevent further large increase for material which is read with ease. For such material the pupils of these grades approximate their adult rate.

The types of error.—In the study of errors the six types of error designated by Gray and mentioned above are considered. The

calculations include in each case the paragraph on which failure occurred. This means that the total number of errors made by a grade on a given paragraph is the sum of the errors made by pupils who read the paragraph successfully and by pupils who failed upon it.

The results (Table I) show that gross mispronunciation is the most common type of error in the first grade, and substitution next. Minor mispronunciations in the first grade are few, because the words encountered by the child are in general familiar to him in their spoken form. If he recognizes the words at all, he is likely to give them the correct pronunciation.

TABLE I

TYPES OF ERROR IN PERCENTAGES—SUMMARY

ERRORS	GRADE							
	I	II	III	IV	V	VI	VII	VIII
G (gross mispronunciations)	44.8	23.8	18.1	11.6	13.8	16.7	11.8	10.5
M (minor mispronunciations)	1.9	3.8	23.2	21.8	32.0	36.3	31.4	41.9
O (omissions)	1.6	5.2	4.9	8.0	4.7	9.0	8.2	4.7
S (substitutions)	31.9	36.9	28.2	30.8	24.6	20.6	26.4	18.9
I (insertions)	4.7	4.4	11.1	7.5	6.6	6.1	8.8	7.0
R (repetitions)	15.1	25.9	14.2	20.2	18.1	11.1	13.2	16.8

In the second grade substitution has become the most characteristic type of error, and repetition has taken second place. The increase in the number of substitutions to first place is probably due in part to the large place which thought-content has in the reading of the pupil of this grade. Grouping of words is now more used than in the preceding grade and may result in substitution, since attention is given to the entire group rather than to the individual words. Another factor is the fact that the pupil of this grade, and of the third and fourth grades, has comparatively recently learned large numbers of words, and that many of these look very much alike. Repetitions are becoming prominent in the second grade because of the increasing presence of word- and thought-difficulty. Gross mispronunciation still occupies a relatively high position. Minor mispronunciation is not prominent here for the same reason as in the first grade.

In the third and fourth grades substitution still holds first place, but minor mispronunciation has taken second place. The words now being read are not thoroughly familiar to the child in oral language, hence portions are often mispronounced. The child is coming also to depend upon his power to analyze words, and so minor rather than gross errors occur, because this power enables him to derive a pronunciation for unfamiliar words which in most respects is correct.

In the fifth, sixth, seventh, and eighth grades the relative frequency of the types of error is much the same. Minor mispronunciation has become the most common error, and substitution is next in frequency. In these grades many of the words encountered are not thoroughly familiar to the child. The full correct pronunciation either in speech or in oral reading has not been frequent enough to become automatic.

A study was made of the types of error in the first paragraph read and in the first failed paragraph. The results for the first failed paragraph were derived in the following manner: The number of errors of each type made by each pupil on the paragraph on which failure occurred was counted and recorded. The six totals, representing the six types of error, were then found, and from these was found the total number of errors. The percentage of each type of error was then computed. The results are shown in Table II. The chief features noted are the following: (*a*) the large percentage of gross mispronunciations made by the first grade in paragraph 1 and in the failed paragraph; (*b*) the low percentage or absence of gross mispronunciations in the second grade and above for paragraph 1, and the large percentage of these errors for the failed paragraph; (*c*) the large percentage of repetitions for paragraph 1 and the small percentage in the failed paragraph; and (*d*) the approximately equal percentage of substitutions in the two paragraphs.

A special study of substitutions was made in order to discover the effect of increasing difficulty upon the nature of the substitutions made. The substitutions were considered in three classes. The first class consists of those which made little or no change in the meaning of the sentence, the second class of those which made

much change, and the third class of those which gave no connected meaning. An examination of the results shows that in general, while substitutions of much change are irregular in number, the percentage of substitutions of little change decreases from paragraph 1 to the more difficult reading, and that the percentage of substitutions of no meaning increases. In the easier

TABLE II

PERCENTAGE OF ERRORS OF EACH TYPE FOR PARAGRAPH 1 AND FOR THE FIRST FAILED PARAGRAPH

GRADE	ERRORS					
	G	M	O	S	I	R
	Paragraph I					
I	45	1	2	28	6	18
II	6	.....	4	39	4	47
III	.....	.....	.....	20	.....	80
IV	.....	.....	22	11	11	56
V	.....	.....	7	30	19	44
VI	.....	.....	42	29	.....	29
VII	.....	.....	38	19	19	25
VIII	.....	.....	9	9	9	73
	First Failed Paragraph					
I	49	8	1	33	3	12
II	40	5	2	33	3	17
III	33	28	2	25	6	6
IV	28	29	7	25	1	10
V	32	41	.5	19	.5	7
VI	32	46	5	14	2	1
VII	26	49	7	14	1	3
VIII	19	59	5	15	1	1

reading the pupil is following the thought, and if any substitution is made it is more likely than not to fit into the context. As the reading becomes more difficult, the thought is lost in the maze of difficult words, and substitutions are very largely on the basis of similarity of appearance in some respect, rather than on the basis of thought-suggestion.

Comprehension.—The results for comprehension indicate that the degree of comprehension decreases as consecutive paragraphs of

the test are read. This is probably due to two factors. The first of these is that more and more words occur whose meanings the pupil does not know, and the other that as the words become less familiar the pupil must give more and more attention to them in order to recognize them. The thought-content therefore receives less attention. The decrease mentioned does not begin, however, until the fourth paragraph is reached. This is probably due to a

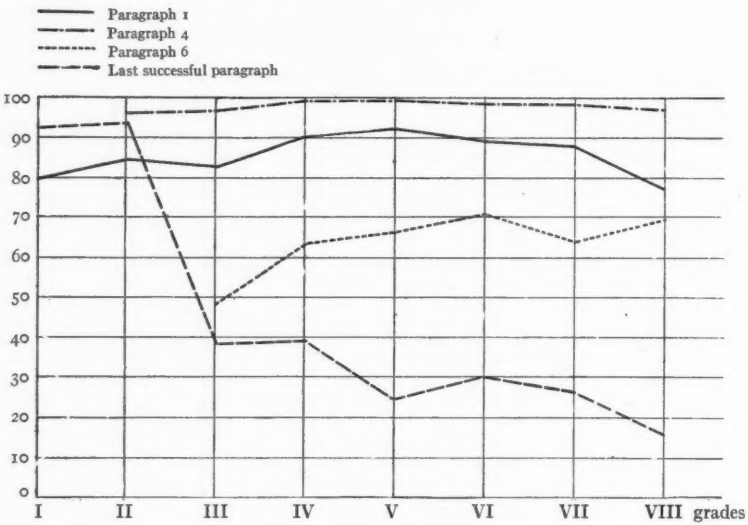

FIG. 2.—Comprehension

better adjustment to the situation on the part of the pupil as the reading proceeded.

A comparative study of comprehension was made on paragraphs 1, 4, 6, and the last paragraph read successfully. The results (Fig. 2) show that for paragraph 1 the degree of comprehension remains very much the same through all the grades. This indicates that the pupil of the lower grades gets practically as complete an idea of the content as the pupil of the upper grades. The first paragraph contains only such words as the primary pupil is familiar with in spoken form. If he can read the paragraph even in a halting man-

ner, and with some errors, he gains a fairly adequate knowledge of the story, for every word he calls correctly is understood.

The results for paragraph 4, beginning with the second grade, show a still more remarkable equality in comprehension through the grades. By this time the pupil has apparently become thoroughly adapted to his situation and has projected himself fully into the task before him. The words are still of the sort with which the pupil of the lower grades has become familiar through the hearing of stories if not in ordinary conversation. The degree of comprehension is relatively high, therefore, as in paragraph 1. The probable explanation of the fact that the percentages are somewhat higher throughout than for paragraph 1 is that there was a better adjustment to the reading situation, as previously stated.

The results for paragraph 6, beginning with the third grade, show that difficulties of some sort are being encountered. The scores throughout are lower than those of paragraphs 1 and 4, and there is a gradual rise of scores through the successive grades. The pupils of the lower grades are now having to give much of their attention to the pronunciation of words, and even the pupils of the upper grades are finding it more difficult to attend properly to word-pronunciation, emphasis, and inflection.

In the last successful paragraph there is a rapid decrease in the degree of comprehension through the third and fourth grades, and a more gradual decrease through the remaining grades. The rapid decrease indicates that the pupil of the third and fourth grades acquires ability to pronounce words more rapidly than he acquires the ability to get their meanings. He has about exhausted his oral vocabulary, and, though new meanings are acquired, they apparently come more slowly than the rate of progress in the more mechanical skill of word-pronunciation. The process of their acquisition does not lend itself so readily to the processes of automatization. The acquisition of meanings is more largely an experiential process than is the association of a printed symbol and a particular word-sound. The results show that the power to discover meanings remains low throughout the grades. The pupil of the intermediate grades has acquired a fair degree of skill in mere word-calling; but if interpretation of the most difficult

material which he can read with considerable fluency is demanded, he is sadly deficient. This may be a condition due to local causes not apparent, or it may be the consequence of an almost universal practice of continuing oral reading throughout the grades and giving little direct attention to silent reading.

CONCLUSIONS

No attempt is made to arrive at general conclusions. Such statements as are made refer only to the present study. The most significant conclusions are the following:

1. The rate of reading increases rapidly in the first and second grades and then more gradually until the highest rate is approximated in the sixth or seventh grade. There are plateaus in the curve of progress from the third grade through the fifth and from the sixth grade through the eighth.

2. Increasing difficulty of reading material causes an increase in the percentage of gross and minor mispronunciations, a decrease in the percentage of omissions, insertions, and repetitions, and little change in the percentage of substitutions.

3. Increasing difficulty of reading material causes a more rapid decrease in the degree of comprehension than in the power over the mechanics of reading.

THE EFFECT OF AGRICULTURAL EMPLOYMENT UPON SCHOOL ATTENDANCE

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In the first burst of patriotism that swept the country in the spring of 1917 several of the state superintendents of education advised local officials to relax compulsory-attendance regulations in order that school children might be released for work on the farms. In some states, as in Kansas, certain requirements were established: that a boy should have a physician's certificate of physical fitness, a letter from his employer stating the wages and the kind of work required, a passing grade which could not be known until three or four weeks before the close of school, and that he should make reports to the superintendent while at work. It is believed by the superintendent that these requirements reduced very greatly the number of boys who would otherwise have left. In Missouri the state superintendent specified, further, an age limit of fourteen years. Full credit for a year's work at the present standard was to be given. In Illinois the state superintendent specified that boys excused must be over fourteen and were not to be excused until May 1. No physical examination was required and no system of supervision was provided. In Indiana the appeal was made in behalf of the canning factories. The superintendent of public instruction said, "Our canning factories, in the crisis through which we are passing, rank among our most valuable assets."

In New Jersey the situation was somewhat better from the point of view of the child's welfare. The Junior Industrial Army was formed under the direction of the assistant superintendent of education and divided into the three branches of agriculture, home gardens, and girls' service. Boys of fourteen or over who had their parents' consent and were in good physical condition were permitted to leave school and enlist in the agricultural branch.

Local school superintendents were made responsible for such boys, and the state department of education was thereby enabled to obtain complete information about each child who left school. In this state the "camp system," under which the boys can be carefully supervised, was found to work very successfully. But although New Jersey excels in having checked the number of children who actually left school to enrol in farm work and in having the machinery for keeping track of them, still investigation shows that care was not taken to find out in every case whether there was actual need for the boys' help, and that there is much doubt as to the actual productivity of their work. One camp of boys in New Jersey, having no farm work to do in its vicinity, was put to work mowing lawns and weeding the roads. Some farmers believe that many children when given the chance left school more for the very natural reason that school was irksome to them than because they had any unusual desire to work, and one remarked that "it helps a lot of boys to graduate"—an opinion borne out by the facts.

While there is no doubt of the excellent intentions of the authorities who released the boys for farm work, there is equal certainty of the ultimate shortsightedness of the policy. It was not appreciated that in general city boys are not wanted in farm work. Letters received by the National Child Labor Committee from grange officers made the fact clear that most farmers do not want boys under sixteen, except their own. Individual reasons ran as follows: "City boys are not worth their keep on a farm"; "The work is too heavy for children"; "Horses are too valuable to trust to children"; "It would take two farmers to one boy"; "How would manufacturers like to have green hands come into their shops for a few days? The same question can be applied to the farmer in trying to work school children who would simply be under foot."

The evidence of the situation in Europe after two years of war throws further light upon the subject. In the sudden stress of war the case of the children was temporarily forgotten. In England, after the taking over of school buildings for military purposes, the enlistment of teachers, the cutting down of school appropriations, the relaxing both of the laws governing labor and of the efforts

in child-welfare work, the country has at last awakened to the fact that, to put it mildly and in the words of the Health of Munition Workers Committee, the children "are drawing on their strength." The facts are that thousands of children in England are without teachers or schools; 600,000 children have left school permanently to go to work; there are about 3,000,000 children between twelve and seventeen out of school, and juvenile delinquency has increased about 40 per cent. In Berlin as well there were in 1915 twice as many crimes committed by children as in 1914, and it is reported that 8,000 children between fourteen and sixteen are working in Prussian mines.

These are not conditions that we in America care to emulate, and there is no reason why, with the experience of the other countries to warn us, we should fall into mistakes that they are now making efforts to retrieve. The degree to which we have already relaxed the laws governing compulsory school attendance and labor is probably due as much to popular ignorance about the conditions of farm work for children as to patriotic enthusiasm. The Federal Child Labor Law is really applicable to only one-fourth of the children between the ages of ten and sixteen employed in gainful occupations. The percentage of those engaged in agricultural work in the entire country is 72, and in some states the proportion is even higher. In Kentucky, for instance, it is 82 per cent. These the Federal Law does not touch. There is, moreover, a general acceptance of the belief that the farm is an ideal place for a child. The farm work of the boy or girl is considered to be of great educational value, the hours are supposedly not burdensome, and the outdoor work is healthful. A boy on the older type of farm, working with his father on a variety of occupations, did receive much that was of real educational value. But today the ordinary work done is as much routine and as little educative as the work of children in industry. Modern agriculture, like modern industry, is run on the factory system. Its object is to have the workers do the same work, in the same way, at the same time—which means for as long a time as they will stand it.

It should be remembered, too, that the farmer is as eager to secure cheap labor as is the manufacturer; and though the parents

may in some cases, as in that of the Texas cotton-picker, realize that "they git five months schoolin', and it ain't nuff," most of them are caught in a vicious round of necessity and are indifferent to everything except the productive value of their family. Among the berry-pickers who go out from Baltimore in the spring and autumn and take their children, from seven years up, to work in the fields, the compelling argument is heard, "What you goin' t' do—you can't starve—they got to work."

Although the reform in child labor has focused in the past upon city conditions, the condition of the rural districts has been hardly less acute. The present situation has brought home the fact that after all agriculture is the basic industry of life, and that this cannot suffer unattended by the suffering of the whole nation. The fallacy that we should turn child labor on to the farms, is, however, almost as great as would be the recommendation to turn children with rifles into the trenches. It saps the national strength no less. An examination of existing conditions in several localities will make this clear.

The average rural-school term for children in the United States as a whole is 140 days, while the city term is 180 days. The short term is in itself a handicap for country children, but the irregular attendance prevailing almost everywhere is even more serious in its effect upon the pupils. These are the figures for the average attendance throughout the country: of every 100 children enrolled in city schools the daily attendance is 80; of every 100 enrolled in rural schools only 68 are in attendance daily. Thus for every 100 days of schooling per year received by the city child, the average rural child receives only 65. An investigation conducted by the National Child Labor Committee in Oklahoma in 1917 showed that in rural districts the compulsory-attendance law is commonly ignored. To begin with, the law applies to only 66 per cent of the local school term, but in addition to this it was found that in the preceding school year the attendance was only 59.8 per cent. The insufficiency of the law was surpassed by the meagerness of the attendance. The children go to school but little more than half the short period during which the schools are in session. The taxpayers' money is wasted on the equipment of school buildings

and teachers' salaries, but the most deplorable waste is in the moral and educational loss to the children. The causes for absence are many. In the totals, farm work comes first, the number of days missed on this account by both boys and girls out of 6,389 records examined being 73,121; second comes illness, which caused 44,148 days of absence; the third cause is indifference, synonymous with parental indifference, which was responsible for 26,382 days; fourth comes housework, with 17,862; and fifth the combination of bad weather and distance from the school, which kept children away for 16,997 days. The absences for unknown causes total only 2,791 days. Farm work and housework together were responsible for nearly half the absences. Furthermore, retardation in school work was found, as might be expected, coincident with non-attendance. A study based on 5,656 known cases shows that 95.9 per cent of the number of daily attendants passed to higher grades. Only 56.6 per cent of the migrants and 63.5 per cent of the farm workers were promoted. The effect of migration and of children's work in the house and in the fields could not be better illustrated.

The use of child labor in the sugar-beet fields of Colorado is seen to produce the same results. The work is done chiefly by foreign immigrants, the so-called "Russians" predominating. The workers generally live in settlements entirely apart from the American life of the town, in poorly constructed temporary shanties. The only possible contact with American life is through the association of their children with American boys and girls in the public schools. But their insistence that the children shall help with the work in the fields makes school attendance extremely scanty—at best irregular. The compulsory-attendance law is not enforced in the best section. Children from seven and eight years up work in the beets, thinning, hoeing, pulling, and topping; the average work day in the harvest season is from 6:00 A.M. to 6:00 P.M., and instances were found of children working from 5:00 A.M. to 7:00 P.M. It is not only among the poorer population that these conditions exist. One parent boasted to the school principal that his boy was worth $1,000 for work during the beet season, but if he went to school he was nothing but an expense. Another family,

who in the previous year had made $10,000 from their farm, kept the two little girls, aged seven and eleven, out of school to work in the fields. In this region, as in Oklahoma, it was found that the preponderance of absence from school was among the beet-workers, who missed more than three and one-half times as many days as the other children in the first three months of school in the fall of 1916. Table I shows the relative degree of retardation for beet-workers and non-beet-workers.

In the rural districts of Kentucky the only restrictions that apply to children working on farms are those governing school attendance. But these, as well as the child-labor law which forbids anyone to employ children under fourteen during the time the schools are in session, have slight bearing upon actual conditions, as they are quite universally disregarded. Kentucky leads the states in tobacco-growing, and in this industry children as young as nine are considered "hands." In addition to tobacco-raising, plowing, corn-growing, berry-picking, etc., help to occupy the 82 per cent of child laborers engaged in agriculture in this state. The case of the two children of a certain dairyman, the owner of 150 acres, is fairly typical. His oldest daughter is fourteen and his oldest son ten. She and her brother rise at four to milk the 17 cows, she separates the cream, cleans the pans, cares for the younger children, helps with the housework, drives the cows in from the pasture at night, helps again with the milking, and they finish the day's work just before supper. She has been enrolled in the eighth grade for two years, but each year has left school to work at home. Her father said, "I couldn't a-got along this year without her help. She's been out o' school since Christmas helping with the dairy and housework. I told her if she'd help me out now, I'd let her finish the eighth grade next year. She wants to be a teacher, but there's plenty o' time."

Throughout the rural districts of the entire state farm work interferes materially with the children's schooling. An inquiry was made into the records of children under sixteen in various districts of the seven counties of Clark, Hardin, Henderson, Nicholas, Rockcastle, Trigg, and Warren. In these counties 141 schools were visited, with a total of 5,895 children, of whom 1,133

TABLE I

DISTRIBUTION OF PUPILS AMONG GRADES, BY AGES, FOR TYPICAL DISTRICTS, SEPTEMBER–NOVEMBER, 1915

AGES	GRADES											TOTAL
	1	2	3	4	5	6	7	8	9	10	11	
			Beet-Workers									
6 years	95	3										98
7 "	70	22	2									94
8 "	57	39	25									121
9 "	19	40	29	20	2							110
10 "	17	20	37	36	15	1						126
11 "	5	12	19	29	26	10						101
12 "	3	5	20	26	39	18	7					118
13 "	2	2	10	9	20	20	13	6	2	1		85
14 "	....	2	4	6	9	15	25	5	1	....		67
15 "	1	1	2	2	5	9	11	5	1	....		37
16 "			....			2	2	8	1	1		14
17 "			1			1		1	1			4
Total	269	146	149	128	116	76	58	25	6	2		975
			Non-Beet-Workers									
6 years	216	17										233
7 "	87	77	19									183
8 "	36	49	63	10	3							161
9 "	10	20	29	45	24							128
10 "	4	4	25	41	49	11						134
11 "	3	3	8	21	33	30	7					105
12 "	1		5	17	12	32	34	8				109
13 "			2	3	9	13	22	29	3			81
14 "				1	3	7	12	33	2	1		59
15 "				2	1	1	5	13	3	1		26
16 "							5	7	..	5		17
17 "									1	..	1	2
18 "									1	..	..	1
Total	357	170	151	140	134	94	85	90	10	7	1	1,239

were negroes. The greatest number of absences of both white and negro children was due to farm work; illness ranked second, housework third, indifference fourth, and so on. In the case of the white children farm work and housework together were responsible for almost as many days of absence as all the other causes combined; in the case of the negro children they caused more. In the matter of retardation the results are exactly what was to be expected. For the white children the percentage of retardation was 13.2 among the daily attendants, 22.8 for other absentees, and 46.8 for farm-work absentees. For the negro children the percentage is 34.2 for the daily attendants, 49.2 for other absentees, and 72.6 for the farm-work absentees. Retardation is not only a loss to the child, but a tremendous financial loss to the state.

It is evident beyond any shadow of doubt that in the rural districts studied the agricultural work of the children is responsible for the greater part of the non-attendance in the schools and consequently for general backwardness in education. For it is not only the children who remain intermittently out of school who fail to progress normally, but also the children with whom they are associated. There are few people who have not experienced at one time or another the sensation of being behind—of the impossibility and hopelessness of trying to compete against odds. This is what happens to the over-age boy or girl in school. Once let him fall back among younger children, where he feels hopelessly outdistanced by his fellows, and he will easily and naturally give over the race. He will turn to farm work as a much more interesting occupation than the daily grind at school, like the Kentucky boy whose father said, "He'd ruther work than go to school." In such a case the father is responsible, the school is responsible, for failing to make education as live and vital a thing as chores, and the attendance officer is also responsible.

But very little can be done toward a strict enforcement of the existing laws in rural districts until there is a change in the method of selecting surpervisory officers, both for the county and for the districts. In 27 out of 40 states in which the county superintendent is the supervisory officer, he is a partisan political officer elected by popular vote and consequently disinclined toward doing any-

thing unpopular. One such officer said, "I do all I can to *encourage* attendance. I do not attempt to *enforce* it because I like my job and want to keep it. Elections in this state are only two years apart." Local school trustees, in the states which are organized for administration on the old district basis, are too close to the people to enforce the law. One doesn't like to prosecute his next-door neighbor for his children's truancy. It is much more convenient and pleasant all round to allow the law to remain in peace, a dead letter. When, as in the rural districts, the law is unsupported by any uniform restriction of child labor, it simply means that individuals will do very much as they please.

But the greatest responsibility of all lies with public opinion, which has tacitly consented that the interests of agriculture and not of the child should become the primary consideration, observing the forms of democracy without its spirit and meaning. More crimes are perhaps committed in the name of personal freedom than for any other cause. In industry it is admitted that personal freedom should not be permitted as an excuse for a man engaging in a dangerous occupation. A man is not allowed to jump off Brooklyn Bridge because he wants to, nor to beat his wife because the fancy strikes him. The hair of our national conscience has finally risen in horror at the picture of thirteen-year-old youngsters in coal mines and cotton mills. But we have not yet measured the monotony of the beet fields, nor weighted the long sacks of cotton that four- and five-year-old toddlers drag behind them down the cotton rows. Because child labor on the farm is the nearest and the most familiar element of child labor to most of us, it is the very element of which we have missed the significance.

If the pre-war relations of education and agricultural child labor were such as these thorough investigations have proved them to be, what will be the effect of the war upon children? We have seen the part that children play in normal food production, and the tendency toward relaxing the existing regulations at the outbreak of war last spring. Even in times of peace we have neglected the children. Are we to allow ourselves to be blinded to ultimate national strength and welfare by what we consider to be necessary contingencies? The childhood of America is what constitutes its

real wealth, its real safety, its hope for the future. To protect it, to see that education shall not be sacrificed, that the existing education and child-labor laws shall not be relaxed, is the supreme duty. It will demand conscious effort, for we know that European countries with older regulations than ours have failed to provide for their continuation.

Sir James Yoxall said in parliament, "A large portion of our elementary-school system is in ruins—I will not say as desolate as the ruins of Louvain, but there is to some extent a likeness." And Sidney Webb predicts that "peace will involve almost the remaking of the nation's educational machinery." England has seen that her policy of recruiting agricultural and factory workers from school children did not pay, and is now trying to return the children to the schools. It would be folly for us not to prevent before it is too late the mistakes that the other belligerent countries now regret.

EDUCATIONAL WRITINGS

I. SUMMARY OF CURRENT TENDENCIES IN ELEMENTARY-SCHOOL MATHEMATICS AS SHOWN BY RECENT TEXTBOOKS

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Reorganizing the field of study in elementary mathematics is a process that has extended over many years. More than thirty years ago F. A. Walker, in his Boston address, "Arithmetic of the Primary and Grammar Grades," led the revolt against the stereotyped arithmetic intrenched in the school. In 1895 the Committee of Fifteen recommended that the obsolete and unpractical parts of arithmetic be eliminated. More recently extensive studies and investigations have pointed out the waste and futility of teaching topics and problems that are practically never used in ordinary business and social life. Gradually the work has been greatly simplified by dropping or minimizing such topics as alligation, cube root, complex and compound fractions, partial payments, the less frequently used tables, compound proportion, and similar obsolete material recommended for elimination by the Committee on Minimum Essentials. Moreover, the subject-matter remaining has been simplified by breaking down the traditional divisions between topics. For example, "cases" in percentage are reduced to the one principle of "factor times factor," and profit and loss has no claim as a separate topic but is included in the applications of percentage.

The reorganization of the field of study is more than a concession to business utility. It seeks to include those mathematical phases of our social and economic life that aid a child in understanding and interpreting the community life of which he is a potential part. For this reason many more problems than heretofore, definitely embodying business practices and social situations, are included as well as discussions and descriptive material relating to such topics. For example, the subject of banking is fully dealt with. The methods of opening an account, of drawing checks and drafts, of saving, borrowing, and investing money are all carefully explained and applied in the solution of practical problems. Life insurance, taxes and revenues, building and loan associations, corporations, stocks and bonds, and other topics taken from the field of civics, economics, and social affairs are similarly treated. The social setting or the business institution that calls for calculation is studied as

carefully as the mathematical processes themselves. The subject of elementary mathematics is no longer an end in itself, but a very important means to an end.

In the reorganization of mathematics there has been a growing tendency in late years to enrich the field of study by introducing simple work in algebra and applied geometry. This is in accord with the recommendations made by the Committee of Fifteen in 1895 and in harmony with the scientific attitude reshaping the curriculum that has pointed out the advantages in teaching the simpler phases of these subjects in the grades. Gradually a few simple algebraic symbols and principles are being made an integral part of the arithmetic work of the grammar grades. In the solution of the more difficult problems, equations, graphs, and algebraic formulae are used to simplify the work. Algebra, as it is functioning in elementary mathematics at present, however, is more a method than a subject. Geometry, on the other hand, is an outgrowth of the work in practical measurements and mensuration. The aim is to present a few of the more important geometrical concepts, such as the meaning of the terms perpendicular, parallel, right angle, and through simple construction the properties of triangles and parallelograms, congruent and similar figures. No attempt is made to teach Euclidian geometry. The work does not go beyond constructional and concrete geometry.

Accompanying this reorganization of the subject-matter of elementary mathematics, and in fact a part of it, is the notable tendency of an increased emphasis upon skill in the essentials. Studies in retardation and elimination have shown that a great many children leave by the end of the sixth grade. In *Measuring the Work of the Public School* Dr. Judd has pointed out that "one of the major reasons for the enormous increase in the number of non-promotions from the third to the fifth grades in the Cleveland schools was the difficulty which the children encountered in arithmetic." These studies and other statistics have emphasized the necessity of giving a mastery of the fundamental facts and processes in the grades below the sixth. The "Cleveland Arithmetic Tests," the "Courtis Arithmetic Tests," the "Studebaker Economy Practice Tests in Arithmetic," and the multiple standardized scales, drills, and tests described by Mr. Gray in the September number of the *Journal* are representative of a new type of supplementary material now in current use that aims to secure this mastery of essentials. These devices provide a new set of tools by which to measure results and a new method by which to secure them. They have given a new meaning and a new emphasis to skill in the essentials.

The third definite result of the new practical point of view is seen in the adjustment of methods to the interests, needs, and mental maturity of the child. "Instead of leading the child blindly through years of meaningless abstract problems, we have come to follow a child's interests and needs in selecting problems related to the home, the school, and the community." The method of presenting these conforms to the psychology of learning. The recog-

nition of the instincts for play and activity and of the laws of interest, association, and habit formation are clearly shown in both subject-matter and methods. Number concept, ideas, and process are built up through plays, games, dramatization, and motivated activities. At first, in the lower grades, problems growing out of the child's immediate environment build up and enlarge the application of number ideas and processes, and aid as a background for the formal work. Later in the grammar grades community problems of a more complex nature give still wider scope to the mathematical training and lead the child out with a more efficient equipment into the world about him.

These three results that have grown out of the demands of business utility and social efficiency are reflected, more or less clearly, in many of the recent texts. The best of these represents a union of the two elements—a proper knowledge of the subject in its relation to our economic and social needs and an understanding of the mind of the child. Formerly the author was content with a logical scientific presentation on the subject; now he not only writes for the purpose of teaching the child, but he tries to relate the subject-matter to the present and future needs of the child. Though still retaining some of the traditional material of the older books, the newer texts have made rapid advance in reorganizing the subject-matter and methods of presentation to meet modern social and economic demands.

Among the new series of texts issued during the past few years the "Everyday Arithmetics"[1] represent a radical departure from the old type. This series, which has blazed the trail of the new arithmetic, has gone far toward meeting the demands for practical social efficiency. In the entire series but twenty-two pages are given to the topics termed obsolete by the Committee on Minimum Essentials. Of these twenty-two pages, seven are devoted to the "Metric System" and "Foreign Money"—two topics that will undoubtedly command more attention as our close relations with European countries continue. Many of the traditional topics are reclassified under business studies and subjects related to the child's interests and activities. Book III, Part V, chap. iv, "How Business Is Done," "Selling Goods at Retail," "Selling Goods at Wholesale," "Shipping Goods," are typical, as are also the fraction problems in Book II, Part II, chap. iv, "Making Christmas Presents," "In a Boy's Carpenter Shop," "In the Kitchen," "Taking Care of Pets."

The series includes both new phases of old topics and in some instances entirely new topics. "Overhead Charges" and "Profit on Selling-Price" are typical of the latter. "How We Protect Ourselves against Loss," "Meaning of Insurance," "What Our State and Local Governments Do for Us," "Good and Bad Investments," "The Cost of War," and "The Relative Cost of Foods" are typical of the new phases of old types treated. In connection with such types modern business practices and economic and civic situations are brought out clearly through descriptive material and pertinent problems.

[1] *Everyday Arithmetic.* By Franklin S. Hoyt and Harriet E. Peet. Boston: Houghton Mifflin Co., 1915.

The work in algebra and geometry is interwoven with the arithmetic of the advanced book. Similar figures are treated in connection with the problems in ratio and proportion and the algebraic equation is used as a short method in the solution of problems.

Throughout the series the material seems to have been organized from the point of view of the psychology of learning. There is a careful consideration of the step-by-step process by which a child advances from the near, the simple, and the concrete to the more remote, the complex, and the abstract. This careful gradation of work is shown in such topics as "Playing School," "A Third-Grade Toy Shop," in Book I, and in the inductive concrete treatment of fractions, decimals, and percentages in Book II. "Grouped Problems" are characteristic of the series. This is done, the authors say, "to give a sense of reality to the problems and to prevent the confusion in a child's mind that comes from jumping rapidly from one situation to another while he is struggling with arithmetical relations. This not only makes the problem, as it should be, a means to a practical end, but it minimizes the difficulties of interpretation of language and gives the pupils cumulative power in mastering problems as they commonly occur in ordinary transactions."

While the broad conceptions and underlying principles of the series are excellent, there are some features that detract from its value. The provision for abundant, systematic drillwork covering both the mechanical and practical side does not seem ample anough. This perhaps is now a less serious omission, since standardized drills upon the essentials are increasingly more available. The lack of a definite and separate grouping of oral and written work is an objectionable feature. The plan of dividing the books into two parts and numbering each part separately is confusing. Upon the whole, however, these books embody many of the best principles of the new arithmetics.

The *Essentials of Arithmetic*[1] is a three-book series deserving serious consideration. In the Preface the authors sum up the point of view taken as follows:

> The series seek to preserve a worthy and perfectly graded sequence of arithmetic topics, making the connection by showing the application of each topic to some phase of the business life which the pupil is about to enter. In this series the further effort has been made to present only the great essentials of arithmetic and to dwell constantly upon the application of these essentials to social and business life. Unreal fractions, such obsolete methods as compound proportion, and such antiquated customs as partnership involving time, are all set aside and the space thus gained is assigned to vital topics of this generation and this country. Certain other topics, such as the metric system, land measure, and foreign money . . . . are given in the supplement.

The characteristic features common to previous editions of the same authors have been retained. The problems are well graded, both in subject-matter and presentation, and are real to an unusual extent. They contain very little

[1] *Essentials of Arithmetic.* By George Wentworth and David Eugene Smith. Boston: Ginn & Co., 1915.

obsolete material. Exclusive of the Supplement there are but twenty pages. The problems on business practices and business forms are wisely selected and carefully graded. But the material on space relations and the problems using the simple algebraic equations are very limited in number and formal in application.

The entire series gives constant and systematic recognition to the law of habit formation. Provision for frequent and thorough drills upon the number facts, the essential processes, and the mathematical principles is one of the many strong features of the books. At the end of each chapter there are exercises in "Using What You Have Learned," and "Little Examinations." At the end of each section are "Drills and Reviews" that cover not only the chapter under study, but go back over the preceding chapters. The review sections in the books for the intermediate and grammar grades are characterized by (1) drill in operations emphasizing the mechanical side; (2) exercises in problems without numbers, emphasizing the analytical side; (3) applied problems relating to industrial, economic, and civic situations, emphasizing the practical side. In no other series examined is there so thorough and ample provision made for this fundamentally essential phase of the work.

The Stone-Millis series[1] consists of three books: Primary, Intermediate, and Advanced. The Primary contains the work suggested for the second, third, and fourth grades; the Intermediate, the work of the fifth and sixth; and the Advanced, the work for the seventh and eighth grades. In the two-book series the Intermediate and Advanced books appear in one volume entitled the Complete.

The authors' aim "to adapt the subject-matter to the experiences, interests, and immediate needs of the children" seems well realized in the rich problem material of real significance that characterizes the series. The problems in the Primary book are well chosen and make a strong appeal to the interests of third- and fourth-grade children. Many of the problems are grouped to tell a story or to give a situation that teaches a valuable social lesson in itself. The Advanced book opens with a general review of the preceding grade and with additional work in mensuration, including a large amount of geometry. This is followed by problems in applied percentage. The problems under the latter topic furnish many opportunities for dramatizing complex situations such as banking, and buying and selling stocks and bonds.

While this feature of the series is carefully worked out, it is surprising to note that considerable space has been given to nonessential topics such as surveying townships, determining the elevation of the sun, specific gravity, etc. A large amount of geometry has been included, but by complicating it with geometric terms the work appears unteachable in the grades. The inclusion of these topics has crowded out problems for drill and review. The book is very inadequate in the latter respect.

[1] *Stone-Millis Arithmetic.* By John C. Stone and James F. Millis. Chicago: Benj. H. Sanborn & Co., 1916.

The sequence and development of new processes are essential factors in a good arithmetic text. While the character of the problems in this series bears strong evidence of the socializing influence at work in the field of elementary mathematics, the method of approach to such stumbling-blocks as subtraction, long division, and fractions lacks the psychological characteristic of the "Everyday" or the "Essential" series. For example, there has been no effort to develop a concrete background for fractions throughout the Primary book. A few simple fractions are introduced but these only incidentally and they are neither explained nor drilled upon. This lack of a background in the Primary book perhaps explains the over-treatment of fractions in the Intermediate book. Over half of the main text of the book is devoted to fractions. This is an unfortunate arrangement for two reasons: (1) the pupil is plunged into this, the most troublesome and difficult work of the intermediate grades, without introduction or background, and (2) the necessary development work that could have come in the earlier book has abridged valuable reviews and drills in the essential processes, and the developmental and problem work in percentage.

Though the authors say definitely in the Preface that the series aims "to provide means for a mastery of the formal phases of arithmetic through more scientifically organized drills," one is impressed with the lack of adequate exercises in this phase of the work. The series is strong in problem material of real significance but is less adequate in drills and reviews. This latter type of problem and the oral problems are frequently not separately grouped or designated. The average teacher must spend much time in reorganizing the problems for practical schoolroom use.

The Walsh and Suzzallo series[1] of three books, *Fundamental Processes*, *Essentials*, and *Business and Industrial Practice*, indicates by the titles the point of emphasis in each book. This, like the other series reviewed in this article, represents a serious attempt to make arithmetic conform to the new point of view. Many of the traditional topics have been omitted, and practical, up-to-date material has been freely included. Types of the latter are found in Book III under such topics as "Going into Business," "Economical Business Coöperation," "Government and Business Standards," and "Equations in Business." It is to be regretted, however, that the problems under such topics are very few in number.

The books, in the main, retain many of the spiral features characteristic of the old Walsh books. There are four separate treatments of denominate numbers, fractions, decimals, percentage, and interest in Book II alone. Section 1, of Book II, begins with "Oral Counting Drills" and ends with "Dividing Fractions." Section 2 begins with "Adding Mixed Numbers" and ends with "Volumes of Rectangular Solids," and section 3 begins with "Deci-

[1] *Walsh and Suzzallo Arithmetics.* By John H. Walsh and Henry Suzzallo. Boston: D. C. Heath & Co.

mals" but goes back in true spiral fashion to "Volumes of Rectangular Solids" and ends with "Household Accounts." Section 5 begins with "Percentage" and "Interest" but in less than a dozen pages goes back to "Areas of Parallelograms" and to "Volumes of Rectangular Solids" (for the fourth time), and the section ends with "Divisibility of Numbers" and "Standard Weights." While the spiral method is theoretically presumed to correspond to the psychological conditions of learning, actual experience has shown that it does not insure thoroughness in the fixation of the processes and skills. The tendency among mathematics teachers as shown by Jessup and Coffman in *The Supervision of Arithmetic* is to avoid the extreme spiral and topical methods and to favor a combination method embodying the strong points of both.

The lack of adequate provision for application and drill is apparent throughout. Long sociological statements in Book III (pp. 63–65, 66–68, 97–106, 108–11) are followed by practically no problem drills whatever. The fractions $\frac{1}{2}$ and $\frac{1}{3}$ are introduced without any concrete illustrations in the Primary book and then laid aside, and yet, without further help, the child is required to handle such fractions as $\frac{4}{5}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, and, before the development of addition to fractions, to add mixed numbers.

Though there is much that is thoroughly in accord with the best ideas in the subject, the spiral treatment does not appear to give an orderly systematic arrangement that aids in efficient mastery of the essentials.

The *Efficiency Arithmetics*[1] are a new three-book series issued within the past few months. The Primary book is designed for grades one to four, the Intermediate for grades five and six, and the Advanced for the seventh and eighth grades.

These books, while adhering more tenaciously to the traditional organization of the subject-matter of elementary mathematics than the Everyday and the Stone-Millis, include a large body of concrete problems based upon data secured from business firms, government bulletins, and official and other such sources. Many of the fraction problems in the Intermediate and Advanced books are transcripts from regular purchase slips. "Farm Problems in Practical Measurements," "Efficiency in Business," "Paper, Printing, and Bookbinding," are others of the same type. The numerous "Grouped Problems" on such timely topics as "Thrift," "Savings Stamps," "Poultry," "Bees," and "Live Stock" in the Intermediate book; and the excellent practical problems in the applications of percentage to food values, to the marketing of meat, milk, and foodstuffs, and to the economy in the home and in business are not only interesting in themselves but are a practical embodiment of our wartime economy program. The section upon practical measurements begins with problems of the school shop dealing with the rectangles, circles, triangles, and prisms and applies the principles to the construction of

[1] *Efficiency Arithmetics*. By Charles E. Chadsey and James H. Smith. Chicago: Atkinson, Mentzer & Co., 1917.

roads, waterways, and dams, and to measurement by scientific instruments such as the barometer, gas meter, and steam gauge. The geometric work in connection with practical measurements, the use of the algebraic equation in the solution of problems, and the graph in presenting the "function" idea in relation to two variables are commendable efforts that evidence the widening of the scope of elementary mathematics.

The series gives an important place to drills and reviews. This is the first of the new texts to embody in its pages a set of standardized drills upon the essential processes. A series of more than six hundred problems, using whole numbers, arranged by Assistant Superintendent Spain, of Detroit, appears in each book. A corresponding series in fractions arranged by Mr. James H. Smith is given in the Intermediate book.

A number of separate books dealing with the beginning of number study have appeared from time to time. These books are founded on the sound psychological principle that number concepts should grow out of multiple number experience. These books are designed primarily for first-grade teachers' use, though the simple language, well-graded exercises, and attractive illustrations make them adaptable to second- and in some instances to third-grade use.

First Journeys in Numberland[1] was the first book of this type to appear. It was soon followed by *First Year in Number*.[2] These books use the plays, games, constructive activities, and familiar experiences of first- and second-grade children to build up number concepts and ideas for later mathematical work. They serve the same purpose in introducing the study of arithmetic that the primer has long since done in teaching beginning reading. Mr. George W. Myers, in the Introduction to *First Journeys in Numberland*, says, "If the work of mathematical instruction were carried on through the succeeding years of the elementary school with as much regard to the learner's needs, interests, and possibilities as it is carried through this little book, it is believed that we might hope soon to realize in a measure the real aim of public elementary school mathematics."

Number Games for Primary Grades,[3] by Harris and Waldo, is a suggestive supplementary text that aims "to create an active interest in numbers by applying it through experience." Many of the games and devices are applicable to third and fourth grades. This book, though helpful to the inexperienced teacher, lacks the strong, motivating principle characteristic of *First Journeys*.

[1] *First Journeys in Numberland*. By Ada Van Stone Harris and Lillian McLean Waldo. Chicago: Scott, Foresman & Co., 1911.

[2] *First Year in Number*. By Franklin S. Hoyt and Harriet E. Peet. Boston: Houghton Mifflin Co., 1912.

[3] *Number Games for Primary Grades*. By Ada Van Stone Harris and Lillian McLean Waldo. Chicago: Beckley-Cardy Co., 1917.

Number Stories,[1] by Alhambra G. Deming, presents arithmetic problems in a live setting, but the time required for reading and discussing these five stories is not commensurate with the gain therefrom. The book is intended for teachers in the intermediate grades.

II. COMMENT ON CURRENT EDUCATIONAL WRITINGS

1. *A textbook on the vocational-guidance movement for teachers and administrators.*—These are days educationally in which the facts and principles of new sciences are taken up rapidly and organized into movements for application to the teaching of children in the public schools. Of all the sociological movements which have affected school practice probably no one has related more pertinently to the child's life-needs than the so-called vocational-guidance movement. No complete summary of the rapid developments in this field has appeared until the present month with the publication of Professor Brewer's *Vocational-Guidance Movement*.[2] A book in a new field ought at least to organize for the student the literature of the whole movement, to state the essential problems clearly, and to evaluate the degree to which the movement ment has been successful in extending educational facilities for children. It ought to develop sound attitudes toward the general field and in the main it ought to help the reader to form critical judgments on the issues of the day. These functions Mr. Brewer's book appears to do remarkably well. The informational function is indeed well fulfilled. The book discusses clearly the problems with which the vocational-guidance movement deals. It does survey definitely the attempts which have been made to date to solve these problems, both in the school and in the occupations. It does evaluate these attempts and it plans a program constructed in the light of what has already been accomplished for the further development of the movement.

The writer's historical sketch (chap. ii) makes very clear the importance of Professor Frank Parsons and the influence of the vocational-guidance work as it was first done in the city of Boston. Mr. Brewer's analysis shows that

> there has been an effective start in many schools in various parts of the country; that many of these efforts have been preceded by a study of the occupational opportunities; that in each of a few cities there is a central vocational bureau; that the colleges are interesting themselves in the movement; that religious associations, governmental offices, clubs, settlements, and libraries have aided in the work of guidance; and that there are many appointment agencies which make an effort to give vocational guidance in connection with placement. We know, too, that at the present moment many American cities are laying plans for inaugurating systematic vocational guidance.

[1] *Number Stories*. By Alhambra G. Deming. Chicago: Beckley-Cardy Co., 1916.

[2] *Vocational-Guidance Movement*. By J. M. Brewer. Macmillan, 1918. Pp. ix+327. $1.25.

Chapter iii on "Educational Guidance" discusses in an important way the child's place in the school, school organization as related to guidance. It shows what the organization has provided in many places and what it should provide in all cities, namely, "one or more teachers whose chief business in the school is to make himself of special use in investigations of this sort." He shows, furthermore, the possibilities for guidance in the school program, taking up the separate subjects and pointing out the degree to which each one can be made a training ground in vocational and educational guidance. He shows the possibilities for guidance in the association of students with each other, discusses the degree to which the pre-vocational and continuation schools can be made instruments of self-discovery, and lays out the problem of definite preparation for the occupation and the development of good traits of character. This first part of the book may be summarized by pointing out a few of his aims for educational guidance from the point of view of vocational guidance: for example,

> to study each child as a separate problem; to make the school organization flexible and to provide for the teacher's playing the part of counselor; to turn to account the vocational possibilities of the school program and to add to the program an effective course on occupations; to encourage and direct such student and club activities as will contribute to the finding of vocational clews; to use the prevocational and continuation school for self-discovery, conservation, and reclamation; to provide in schools of secondary and college grade definite preparation for the occupation; and to develop, with all, good traits of character. We have seen that much progress toward the realization of these aims has already been registered.

Chapter iv deals much more in detail with the technical work of vocational counseling and discusses the use of tests, how analyses are made and may be made of personal qualities; the keeping of record cards; the problem of guidance through placement; the problem of employment supervision; the work of the employment manager; the collection, classification, and use of occupational information; and the equipment of the counselor. These discussions are sane; they are helpfully detailed; they are connected up in each case to the best literature on the problem in question. They should be distinctly serviceable to the school administrator or to the special officer engaged in the problem of vocational counseling.

Chapter v on "Pseudo-Guidance" cautions in a timely way against the many questionable practices in attempted vocational guidance. The author discusses, for example, various theories on which these practices rest. He gives in brief some good examples of the quantitative evidence on the problem and makes definite suggestions for the sound avoidance of these errors in the future. Chapter vi is a discussion of the young worker himself, why children leave school, how do children-employes work, what kind of employment does the young worker obtain, opportunities offered by children's work, and proposed remedies. The problems of the employer are discussed in the succeeding chapter, the new movement for scientific management, the problem of the

"turnover" of employes, the sociological developments as it concerns labor, wages, labor organizations. The book finally closes with a systematic program for vocational guidance. One of the principal functions of such a book ought to be a detailed and clearly organized bibliography together with a systematic presentation of mooted problems and questions in the field under discussion. This function of supplying bibliographic material and of presenting clearly important problems is excellently fulfilled in Mr. Brewer's book.

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2. *A layman's book in the study of heredity.*—Clear judgment concerning the relation between an individual's capacity, his ability, and his performance is necessary if we are to have sound practice in fitting school facilities to the special ability of children. No outcome from the study of biology, from the study of heredity and its applications to the science of education, is more important than the one that affirms that a person's position on the capacity scale is relatively determined by the *third and fourth generation* (and the earlier ones too) and not by the individual's effort or the educational influences with which he is surrounded. Especially important has been the application of such principles to the education of the mental defective in the public schools. Clear grasp of such principles has led to clear thinking concerning what such children can take advantage of in the school program and has delimited sharply the possibilities of academic and manual training for such individuals.

Clear thinking by public-school people on such questions has always been hampered by the lack of simply-written books on the problem at hand. The need for a non-technical discussion of the principles of heredity has been great. Professor Downing's little book *The Third and Fourth Generation*[1] is an introduction to the study of heredity. It is clearly written, and although designed primarily to acquaint young people of school and college age with the essential facts and laws that have been discovered concerning inheritance, is a book which should be placed within the reach of teachers in all grades of the public schools. Likewise the parent of ordinary training will be able to get from this work much of value for the education of children on these fundamental matters.

To make the presentation concrete the author starts with a discussion of the inheritance of physical traits, using the transmission of racing qualities in horses as an example. The illustrations are concrete and are presented in a very interesting style. Material of this sort leads to the more important statements that there is abundant evidence that ability similarly runs in human families. Charts are presented showing the degree to which unusual ability mating with unusual ability, even within the same family, has developed in many cases long lines of noted persons. The succeeding chapters of the book take up special problems in the field. Chapter ii is devoted to showing the degree to which the phenomena of heredity in the higher plants and animals

[1] *The Third and Fourth Generation.* By E. R. Downing. Chicago: University of Chicago Press, 1918. Pp. xii+164. $1.00.

are closely linked up with the process of reproduction. The author has succeeded in writing a presentation of a technical subject with very few gaps in the presentation. Chapter iv summarizes the discoveries of Mendel, of deVries, and of other scientific workers in the field who have revealed the closeness with which the distribution of offspring in successive generations is found to follow a particular statistical law. Chapter v makes use of the elementary scientific principles which have been developed and shows how man, by selecting in a practical way stock for the purpose of breeding, has developed through a grasp of the principle of mutation new breeds of animals, new kinds of grains, fruits, etc. The author here shows that the breeder

> hopes to discover animals and plants in the wild state that may serve mankind well when domesticated and he expects that some at least will be improved by domestication. He is on the lookout for sports or mutants that show valuable new characters. These he adopts and conserves. He makes new combinations by hybridization and watches for complex varieties to separate into their component strains, so as to start valuable pedigree cultures. By close inbreeding he prevents the dilution of valuable traits.

From this concrete description of processes of creation and of the uses that man is making of his scientific discoveries the author turns to another lay discussion of some of the technical details. Under the chapter title "The Visible Basis of Heredity" he sums up in a few pages the present thought on the specific processes by which reproduction is brought about. This is followed by a presentation of apparent exceptions to Mendel's law of distribution of traits. He then treats the mooted question, "Are acquired modifications heritable?" This chapter at least ought to be read by prospective school teachers and by those who have to do with the education of children in general. The book concludes with a sound discussion of the degree to which human characters are transmitted and a presentation of the eugenic program. The point of view and spirit of the book are well typified by the following quotation:

> If, then, the preceding chapters have accomplished their purpose, they have left the impression that the young people, who are to be the mothers and fathers of the next generation, have a right to a frank, yet reverent, presentation of reproduction and heredity, at least a presentation sufficient to make them realize that these phenomena are well within the pale of law and order. Now, one may not marry into a family with a persistent tubercular history in the blind hope that luck will prevent the reappearance of the defective tendency in future generations; we know what to expect. We know that insane and feeble-minded stock is prone to reproduce insanity and feeble-mindedness, and that, on the other hand, ability mated with ability tends to reproduce ability. The expert dairyman carefully inquires into the purity of strain and ancestral performance of the animal he mates with his choice cows. The farmer insists on a hog with certified ancestors. We have sense enough to apply such knowledge of heredity as we possess to our farm stock. It seems little enough to ask that we should exercise as much good sense in producing children as we do in the production of hogs and corn. That does not mean that we can apply the method of the cattle pen

to human relations, but merely that we adopt caution and intelligent foresight in founding a family commensurate with that used by the wise breeder of plant or animal stock.

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3. *A new set of textbooks on oral and written English for the elementary grades.*—The most direct method of improving school teaching at the present time is through the improvement of school textbooks. We shall state dogmatically (what, if there were space, could be substantiated by quantitative evidence) that, because the typical teacher is untrained, inexperienced, and is not equipped with either a detailed knowledge of subject-matter or an intimate knowledge of the methods by which children learn, the greatest improvement in school practice will come only with *the design of school textbooks which will teach themselves*. In no field of study in the elementary schools have we been more prone to commit our teaching to logical analysis, cataloguing, and literary vivisection than in the field of oral and written English. We are recognizing, however, in these days that the analytical abilities involved in learning rules and in using rules concerning correct speech have very little to do with the development of habits of correct speech themselves. The review editor pointed out in this *Journal* some months ago certain new developments in this direction as represented by other textbooks. A new set of textbooks[1] has just come to the desk which will make an important contribution to the sane teaching of oral and written English to children. The set is unique in several ways. In the first place, the authors distinguish between the problem of developing habits of correct, natural, and exact oral and written English and the development of a sufficient amount of analytical skill in recognizing grammatical forms and in analyzing various types of usage. The first book is devoted to the former, the second book to the latter. The emphasis of Book I is distinctly laid on oral composition. There are over three hundred oral exercises in the entire book. Letter-writing is emphasized. Interesting examples of reproductions of famous letters are used. The extended correspondence of several school children, the situations in which letter-writing and all other forms of written work are used, are made as far as possible real and practical to the child. The correction work is systematic. The responsibility of correcting the class work is thrown back on the pupil in a "group exercise." As the authors say, this makes *the pupil*, not the teacher, *the critic*, and is an example of the sane insight displayed in the organization of these books. Story-telling pictures are made the basis for oral and written work and are used constantly throughout the course. Biographical studies, interesting, simple and appropriate, are called up at short intervals. Technical terms have indeed been reduced to a minimum and technical grammar has been almost eliminated from the first book. The authors claim to have made

[1] *Oral and Written English.* Books I and II. By M. C. Potter, H. Jeschke, and H. O. Gillet. Ginn & Co., 1917. Book I: Pp. xix+329; Book II: Pp. viii+420.

important innovations in the careful gradation of difficulties that has been strictly observed both with the individual lesson and within the series of lessons. The authors maintain that the book has been tried in a number of schools and has been successful from the standpoint of a carefully graded organization. A thorough study of the books and of the notes to the teacher supports the statement of the publishers that "the authors are continually at the teacher's elbow during the lessons in order that exceptional results may be guaranteed." It is the judgment of the editor that no review adoption of books in oral and written English ought to be made without a thorough examination of these two new texts.

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4. *A manual of story-telling for upper-grade teachers.*—The literature of the oral story for teachers in the primary grades is fairly complete. That story-telling has a proper place in the upper grades, however, has not been clearly recognized by teachers in those grades. Doubtless this has been due, in part, to the fact that the materials have not been organized in textbook fashion, so as to be conveniently available to teachers. A helpful manual has appeared, to fill this gap, in *Story Telling for Upper Grade Teachers.*[1] It discusses the following distinct topics: a characterization of various kinds of stories and their applicability to different grades of school children; how to arrange and to tell stories; types of stories, with a discussion of the use of each in the upper grades; uses of the oral story in the classroom; uses of the oral story with Boy Scouts and Camp Fire Girls; the use of stories and picture study; books on story-telling and collections of stories for telling, and a bibliography.

Each phase of the presentation is accompanied by reprints of selected standard stories, appropriate to the group in question, or by a print of an abbreviated adaptation of such stories to provide teachers with foundational material for story-telling. The selected examples are very good. Definite suggestions are given on how to arrange and tell stories. One of the most valuable handbook features is the long compilation of "Stories for Telling." They are classified by school grades and each grade list is arranged by topics, such as Grade III (for example): "Fairy Tales"; "Nature and Animal Stories"; "Ethical and Biblical Stories"; "Holiday Stories"; "Humorous Stories."

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5. *A handbook on open-air schools for public-school administrators.*—Present-day educational philosophy and current educational movements are constructed around the central doctrine of "saving" the individual child. Our applied psychologies are directed at this problem and our administrative agencies exhibit most strikingly important characteristics of the attempts to solve it. No more important advance has been made recently in the education

[1] *Story Telling for Upper Grade Teachers.* By Allen Cross and Nellie M. Statler. Chicago: Row Peterson & Co. Pp. 299.

of the abnormal individual child than the adoption and spread of the open-air school. It is based upon the recognition of the close correlation between physical and mental health and came as a result of a demand for the "conservation of the health of those children who by reason of a tuberculous affection, poor nourishment, or other debilitating conditions were unable to profit physically and mentally by the life and work of regular indoor schools." A delayed 1916 *Bulletin* of the United States Bureau of Education, which has just been received at this office, presents in most helpful form for the school administrator a summary and an evaluation of the open-air school movement.[1] The aims of the bulletin are to present the history and progress of the open-air school movement, to enumerate some of the results that have been obtained, and to point out in considerable detail the specific programs followed in various open-air schools. The book is not a theoretical treatise. It is primarily a handbook of what to do and how to do it for public-school officials. It contains facts and specific suggestions of procedure, in addition to bringing together a rather complete historical résumé of the development of such special forms of education in both this and other countries. Chapter i discusses the selection of sites and buildings by presenting a score or more of specific floor plans, photographic illustrations, and definite itemized cost analyses. In the same way, school men will find in chap. ii a complete discussion of the equipment and the cost of open-air schools, clothing, sleeping-cots, methods of disinfection, baths, scales, and other equipment. Each aspect is illustrated by statistical tables, photographs, and helpful charts. Important facts which have been collected on the social and economic conditions of open-air children, that can be used in educational propaganda in local communities, are elaborated in chap. iii. Lunches for children who have been admitted to public open-air schools in American cities have been recognized as a necessary accompaniment of more air and a properly graded curriculum. The specific character and cost of school lunches for such children are laid out in chap. vi. Discussions of health supervision, organized in the same concrete and illustrative way, together with general record forms, their construction, the items of information that should be kept, and specific illustrations from the record systems of typical situations, form the materials of chaps. v and vi. Chapters vii to x, inclusive, summarize the historical development of open-air schools in Germany, in England, in Scotland, in France, and in other European countries, together with a fairly detailed sketch of the open-air school movement in the United States. In the remainder of the monograph the treatment goes back to the form employed in the first few chapters, and we find a systematic discussion of various types of institutions which have been designed for the correction of health deficiencies in children of school age. Preventoria, sanitaria, hospital open-air schools, and vacation open-air schools are all discussed. Chapter xii is a detailed analysis of the

[1] *Open Air Schools.* By S. C. Kingsley and F. B. Dresslar. United States Bureau of Education Bulletin No. 23, 1916, published 1917. Additional copies from superintendent of documents, Washington. $0.50. Pp. 283.

educational organization and curricula of open-air schools. Finally chap. xiii puts in the hands of the administrator a helpful summary of results, in increased academic, as well as health, efficiency of children who have been trained in these schools. The Appendix includes very helpful statistical tables showing the extent of the movement throughout the country, cost analyses for the installation of open-air schools, recipes for open-air schools, menus for school lunches, legislative recommendations, and a very detailed and well-selected bibliography.

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6. *A supplementary book for history in the elementary grades.*—Another book[1] in the "Everychild's Series" has appeared. It contains concrete, accurate, and interesting material relating to all phases of the life of colonial children; their games, playthings, Sunday clothes, schooling, textbooks, manners, tasks, and what they read. In presenting this material the author makes much use of first-hand sources, thus making her book all the more valuable and interesting.

The material in the book should find an important place in elementary history from grades five to eight inclusive. The several chapters contain very usable material on which to base brief reports by different members of a class. The volume is worth duplicating. In fact each child in a history class above the fourth grade should some time in his school career have the opportunity of reading the entire book. Since colonial history is often taught in Grade V, the book will no doubt find an important place in the supplementary reading of this grade. To the writer's knowledge there are but few books adapted to Grade V which contain concrete, interesting, accurate, and first-hand history material relating to colonial life. It is to be hoped that books of equal merit will soon appear in the same series on other fields of American history.

III. CURRENT EDUCATIONAL PUBLICATIONS RECEIVED IN JANUARY AND FEBRUARY

A. GENERAL EDUCATIONAL THEORY AND PRACTICE

BADLEY, J. H. *Education after the War.* Oxford: B. H. Blackwell, Broad Street, 1917. Pp. ix+125.

COLVIN, STEPHEN SHELDON. *An Introduction to High-School Teaching.* New York: Macmillan, 1917. Pp. 451. (Reviewed in *School Review* for March, 1918.)

INGLIS, ALEXANDER. *Principles of Secondary Education.* Boston: Houghton Mifflin Co., 1918. Pp. 741. (Reviewed in *School Review* for March, 1918.)

LORAN, CHARLES T. *The Education of the South African Native.* London: Longmans, Green, & Co., 1917. Pp. xx+340.

[1] *Work and Play in Colonial Days.* By Mary Holbrook MacElroy. New York: Macmillan, 1917. Pp. 163.

Maryland, *Compulsory School Attendance in 1916–1917*. Baltimore: State Board of Education. Paper. Pp. 55.

Maryland, *Elementary School Supervision in 1916–1917*. Baltimore: State Board of Education. Paper. Pp. 67.

SMITH, LEWIS WILBUR. *Illinois High Schools*. Issued by Francis G. Blair, Superintendent of Public Instruction. Springfield, Ill.: Illinois State Journal Co., 1917. Pp. 291.

The Teaching of Economics in Harvard University. Cambridge: University Press, 1917. Pp. xiii+248. (Reviewed in *School Review* for March, 1918.)

B. PUBLICATIONS OF UNITED STATES BUREAU OF EDUCATION

CAPEN, SAMUEL PAUL. *Accredited Higher Institutions*. Washington: Government Printing Office, 1917. Paper. Pp. 79.

JUDD, CHARLES H. AND MARSHALL, LEON C. *Lessons in Community and National Life*. Department of the Interior. Community Leaflets No. 10, 11, and 12. January 1, 1918.

MONAHAN, A. C. AND DYE, C. H. *Institutions in the United States Giving Instruction in Agriculture, 1915–16*. Washington: Government Printing Office, 1917. Pp. 115.

Practice Teaching for Teachers in Secondary Schools. Washington: Government Printing Office, 1917. Pp. 82.

Annual Report of the Federal Board of Vocational Education. Washington: Government Printing Office, 1917. Pp. 32.

C. TEXTBOOKS FOR THE ELEMENTARY GRADES

JOHNSON, CLIFTON. *Poems My Children Love Best of All*. New York: Lloyd Adams Noble, 1917. Pp. xviii+256.

MITCHELL, ADDIE F. *Paz and Pablo. A Story of Two Little Filipinos*. New York: World Book Co., 1917. Pp. 95.

Designed to open up to young children the study of history and geography as living subjects.

SMITH, LAURA ROUNTREE, *et al*. *New Common-School Song Book*. Chicago: Beckley-Cardy Co., 1917. Pp. 174. $0.40.

D. TEXTBOOKS FOR THE HIGH SCHOOL

ALEXANDER, P. F. *The Discovery of America, 1492–1594*. Cambridge: Cambridge University Press, 1917. Pp. xviii+212.

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ISAACS, JORGE. *Maria.* Boston: Ginn & Co., 1918. Pp. xiv+209.

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SINAGNAN, L. *A Foundation Course in Spanish.* New York: Macmillan, 1918. Pp. x+278. $1.00.

WENTWORTH, GEORGE, *et al. Commercial Algebra.* Book I. Boston: Ginn & Co., 1917. Pp. v+266.

For first-year commercial high-school pupils, laying a foundation in mathematics upon which may be based, via knowledge of the formula and the graph, success in the technique of commerce.

E. MISCELLANEOUS PUBLICATIONS

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